


NATIONALGEOGRAPHIC.COM/MAGAZINE

FEBRUARY 2005

NATIONAL GEOGRAPHIC

A Great Gray Owl is shown in flight, facing the viewer. Its wings are spread wide, showing intricate feather patterns. The owl's face is dark with prominent yellow eyes and a small yellow beak. The background is a soft, out-of-focus white, suggesting a snowy or misty environment.

THE GREAT GRAY OWL

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THE COVER

A great gray owl homes in on prey in Manitoba, Canada.

BY DANIEL J. COX

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ON THE WEBSITE

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SIGHTS & SOUNDS Experience the remote Empty Quarter.

NAZI GHOST SHIP Explore the underwater wreckage.

BOLLYWOOD Watch the making of a celluloid love story.

AFRICA MEGAFLYOVER Follow explorer Mike Fay's epic journey.

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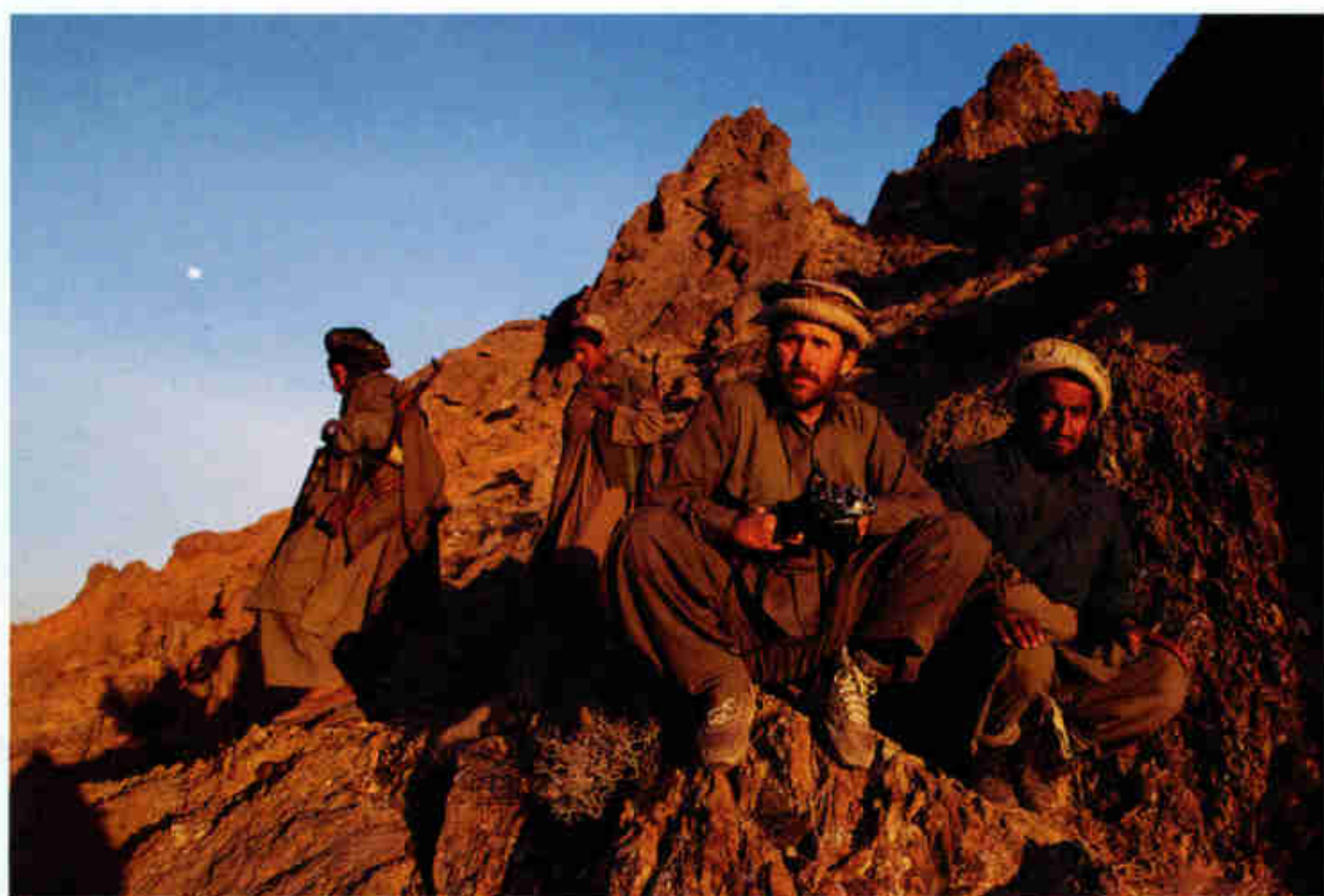
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STEVE McCURRY, MAGNUM PHOTOS (ABOVE); LYNN ABERCROMBIE

Would you knowingly send a friend to a remote, dangerous corner of the world, realizing that he or she could be kidnapped, arrested, shot at—or worse? To bring you the stories that make this magazine what it is, we often have to. We've sent colleagues like Steve McCurry to Pakistan (above), where he's been arrested several times. And dispatched Tom Abercrombie (below, wearing Bedouin attire for a 1966



story) to Yemen and Saudi Arabia.

For this issue, I sent photographer George Steinmetz and writer Don Webster there again—to Arabia's Empty Quarter. George was held under house arrest for three days and survived piloting a fragile ultralight aircraft through a surprise sandstorm, landing while in the sights of a .50-caliber machine gun. To complete

their story, he and Don needed the protection of armed escorts.

Sometimes, sadly, tragedy strikes. As we were going to press, Nicolas Reynard, who photographed our August '03 Amazon tribes story, was killed in a plane crash in Brazil while shooting for another magazine. A warm and generous spirit, Nicolas will be deeply missed by all who knew him. His passing reminds us that any magazine, including ours, is a testament to the courage of its contributors.

Bill Allen



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CHANNEL

SUNDAYS, 8 P.M. ET/PT

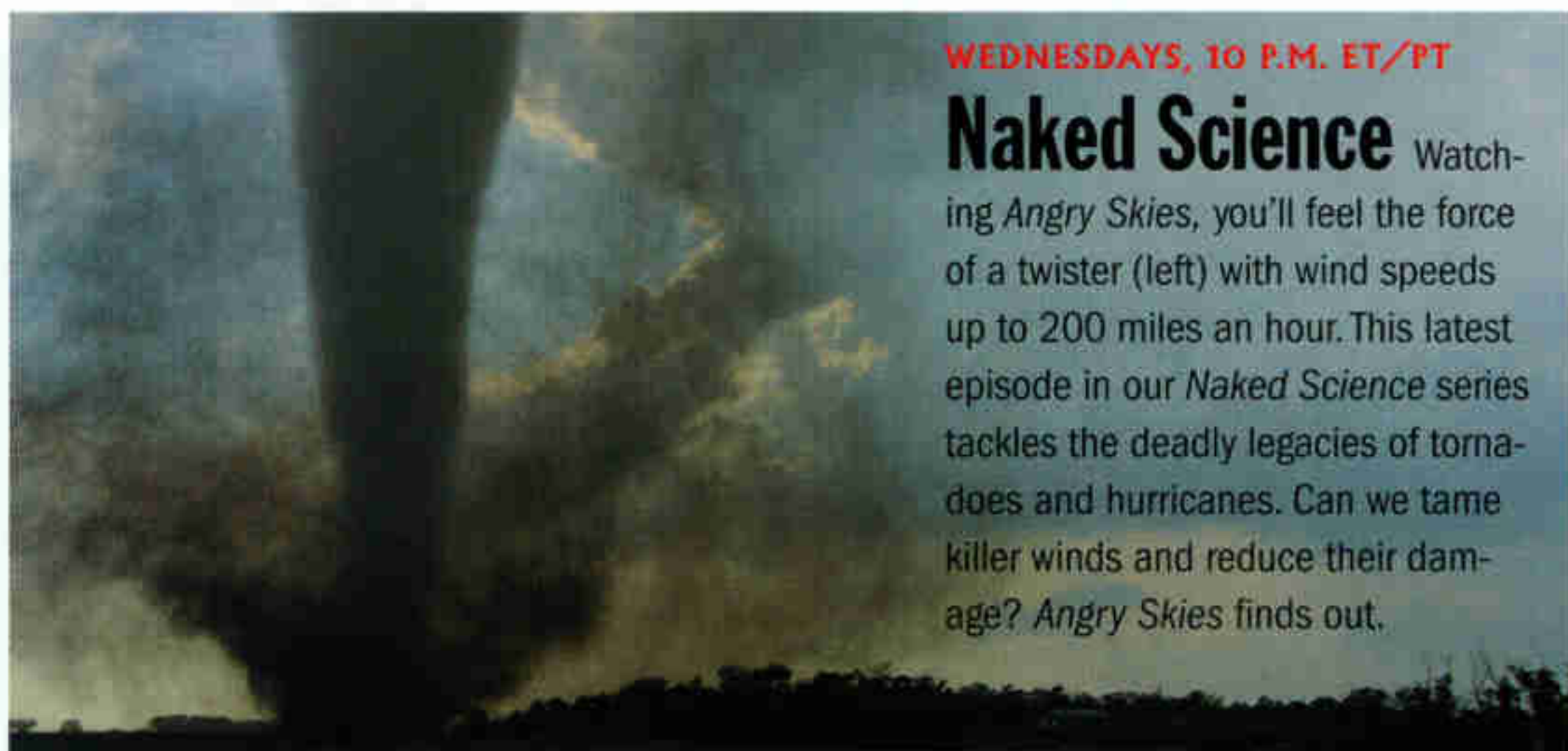
Explorer Something mysterious and even terrifying is happening in forests and swamps around the world, and *Explorer* is on the trail, sniffing out the story. Feral hogs, known for their ferocity, are growing larger—a lot larger—in size and number, and dangerous encounters with humans are increasing. Chris Griffin (right) claims to have shot this 1,000-pound wild pig he dubbed Hogzilla in Georgia's Okefenokee Swamp.

Tune in to NGC's new series, *Explorer*, to learn why feral hog populations in the U.S. and elsewhere have risen dramatically in the past decade and why hunting parties in Australia aim to kill scores of them. Do other hogzillas haunt our forests? Or is it all just hogwash?



WEDNESDAYS, 10 P.M. ET/PT

Naked Science Watching *Angry Skies*, you'll feel the force of a twister (left) with wind speeds up to 200 miles an hour. This latest episode in our *Naked Science* series tackles the deadly legacies of tornadoes and hurricanes. Can we tame killer winds and reduce their damage? *Angry Skies* finds out.



TUESDAYS, 8 P.M. ET/PT

Expeditions to the Edge

A space capsule carrying astronauts Neil Armstrong (below) and David Scott spins violently



out of control. Fighting to stay conscious, the two men struggle to right their spacecraft, Gemini 8. Astronauts in peril are the focus of one of this month's episodes of *Expeditions to the Edge*. Tune in and relive Armstrong and Scott's harrowing 1966 flight. Film footage reveals the brave measures they took to stay alive and save the mission.

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■ **EMPTY QUARTER** See exclusive aerial video of this remote area and experience a rare visit with Bedouin women and children inside their tent. nationalgeographic.com/magazine/0502



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FORUMS

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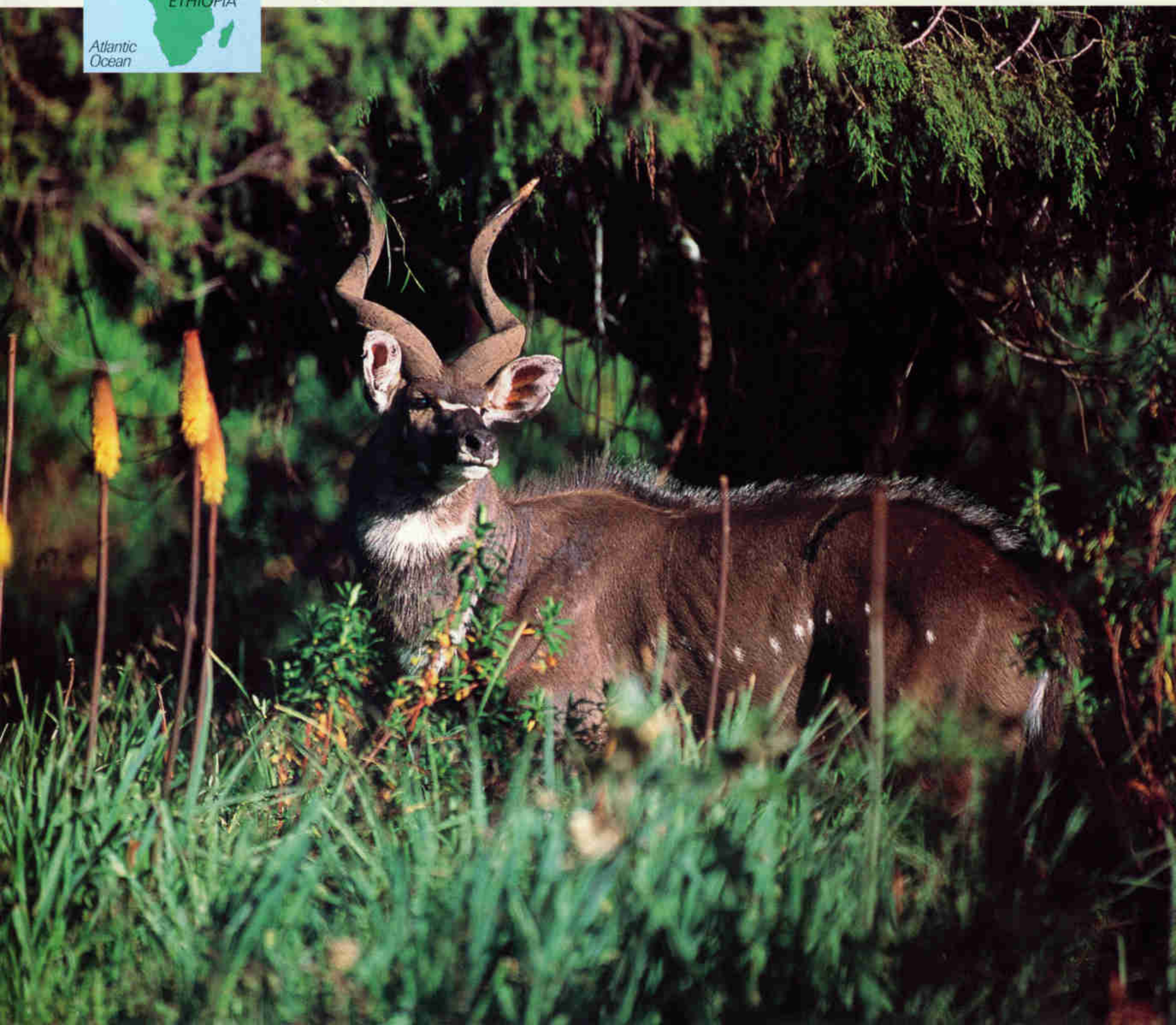
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Mountain Nyala (*Tragelaphus buxtoni*)

Size: Head and body length, 190-260 cm; tail, 20-25 cm; shoulder height, 90-135 cm

Weight: 150-300 kg **Habitat:** Mainly montane woodlands, grasslands and heathlands of southeast Ethiopia, at elevations of 2,500 to 4,300 meters **Surviving number:** Unknown; populations declining



Photographed by Patricio Robles Gil

WILDLIFE AS CANON SEES IT

Victory doesn't always go to the swiftest. The mountain nyala is living proof. When males vie for the attention of females, the competition is slow and deliberate. Three or four bulls follow a female in ritualized parallel walks until the smaller suitors give up and drift away. Evenly matched males circle one another in a slow-motion, strutting dance. The sure-footed browser moves much faster when danger threatens, fleeing at speeds of

around 40 kilometers an hour. But it can't outrun the persistent threats of poaching—both for meat and its magnificent spiral horns—and human encroachment on its few remaining "islands" of habitat.

As an active, committed global corporation, we join worldwide efforts to promote awareness of endangered species. Just one way we are working to make the world a better place—today and tomorrow.



Behind the Scenes



WORKSHOP

Smile When You Shoot That

Cameras were the weapons of choice for students participating in a seven-day photo course offered by National Geographic Expeditions. NATIONAL GEOGRAPHIC senior editor—and workshop instructor—John Echave played a tough guy (above, at center) flanked by actors at the Eaves Movie Ranch in Santa Fe, New Mexico. One of his students snapped this picture during the course, which included lessons in photographing moving subjects using panning, freezing, and fast and slow shutter speeds. For information on future workshops go to nationalgeographic.com/ngexpeditions or call 1-866-797-4686.



NEW RELEASE

Discover This

Adventurers have long been part of NATIONAL GEOGRAPHIC's history. They're also part of its future, according to Peter Miller, senior editor for expeditions. "Explorers are as active today as they were when there were still a lot of blanks on the map," he says. Our new collector's edition, *National Geographic Exploration*, celebrates this latest generation of trailblazers as they survey African forests, delve into the world's deepest caves, and set their sights on the next century of discoveries. Available at newsstands and bookstores, or order online at nationalgeographic.com/magazine/exploration.

SALTON SEA (PAGE 88)

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■ **Guide to Birdwatching Sites: Western U.S.** Learn about the birds of southern California; be sure to check out the section on the Salton Sea (\$7.95).

■ **Southern California Guide Map** Get the lay of the land for the Salton Sea and surroundings. Map includes recreational details along with information on scenic routes (\$6.99).

Calendar

FEBRUARY

23 "Inside Secret Worlds"

NATIONAL GEOGRAPHIC photographer Jodi Cobb talks about beauty, slavery, and other stories at Benaroya Hall in Seattle, Wash. Call 206-624-5677 for tickets. Cobb speaks at the Field Museum's James Simpson Theatre in Chicago on March 22. Call 312-665-7400 for tickets.

28 Crane Cam returns.

Check nationalgeographic.com/magazine/cranecam for real-time coverage of the sandhill crane migration. Lesson plans for teachers and video highlights available on the website.

MARCH

8 Børge Ousland lectures on

his solo polar trek at the Field Museum's James Simpson Theatre in Chicago. On March 10, Ousland speaks at the State Theatre in Minneapolis, Minn. Call 866-880-9577 for Minneapolis tickets. On March 15, Ousland lectures on his Patagonia ice cap trek at Benaroya Hall in Seattle. Learn more at nationalgeographic.com/magazine/0408.

APRIL

20 National Geographic's Strange Days on Planet Earth

series premieres on PBS at 9 p.m. ET/PT. Scientists solve environmental mysteries in *Invaders* and *One Degree Factor* airing April 20. *Predators* and *Troubled Waters* air April 27.

Calendar dates are accurate at press time; please go to nationalgeographic.com or call 1-800-NGS-LINE (647-5463) for more information.



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Visions of Earth





OFF CHICHAGOF ISLAND, ALASKA

It takes just a split second to swap a kayak paddle for a camera, and that's all you have when a whale's jaw suddenly shatters the sea surface. For over 20 years now I've kayaked the waters off Southeast Alaska, photographing humpbacks. Seeing these creatures close-up is as exhilarating to me today as it ever was. This barnacle-laden beauty surprised me when it came up right next to my kayak. Catching it on film was a bit of a miracle.

—Duncan A. Murrell

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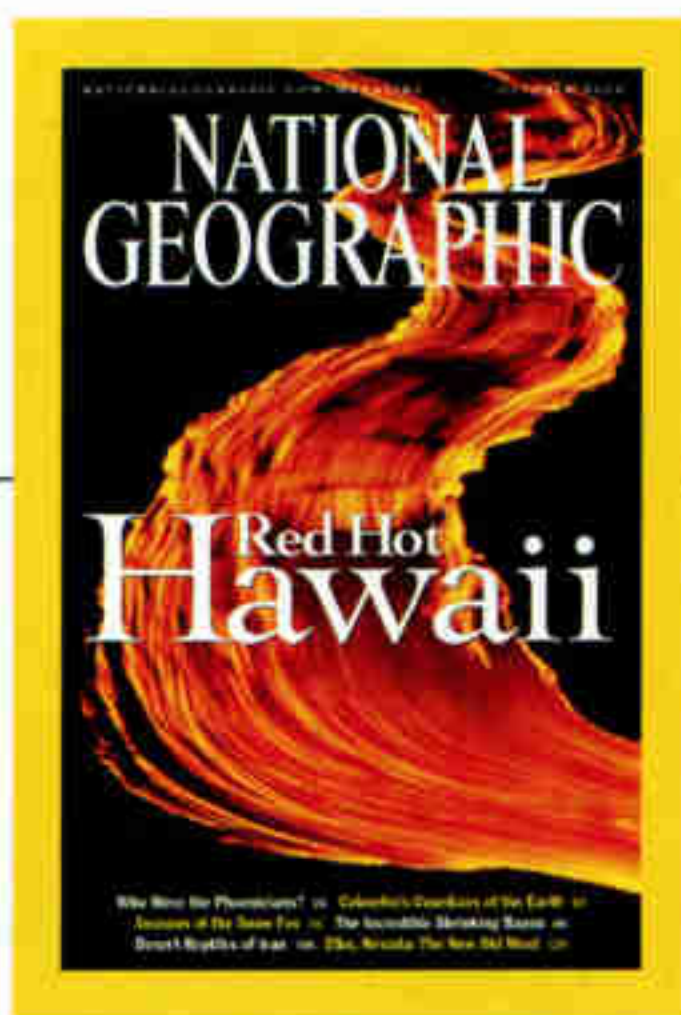
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Forum

October 2004

Typically, one story in each issue becomes a focal point for reader responses. This month it wasn't a single story but the photographs throughout the issue that prompted you to write. Many complimented the images of Hawaiian volcanoes and arctic foxes. Others focused on the tintypes in "ZipUSA: Elko, Nevada." Had we mistakenly reversed the images? For the answer, see the box on the following page.



Who Were the Phoenicians?

Your beautiful article about Phoenician identity piqued my interest in the culture of the ancient Mediterranean. It's exciting to know that modern genetic research has a place in investigating the distant past. Great work!

VALERIA TSYGANKOVA
Wyncote, Pennsylvania

Isn't it amazing that the work of Wells and Zalloua is helping heal the rifts between Christian and Muslim Phoenician descendants and could eventually help unite Jews with them too? What a wonderful thing geography, science, and history can accomplish in the hands of men and women of integrity.

CAROLYN CHEUNG
Brighton, East Sussex

After reading the insightful article about the Phoenicians, I couldn't

help but think about our three internationally adopted children from China, Russia, and Kazakhstan. Their birth certificates state Han, Tartar, and Kazakh, yet we have no other information on the birth parents. It's fascinating to think that they may all be related to, for example, Genghis Khan. It would be wonderful for our children to explore the possibilities of DNA to answer some of these questions.

PAULA AND RICK MAYER
Mequon, Wisconsin

You stated that genetic analysis has traced all modern males back to one common male ancestor, nicknamed Adam. It seems like I've read that somewhere before. Oh yeah, the Bible.

TRICIA TOTH
Pasadena, California

Louisiana's Wetlands

As a native of Houma, Louisiana, I grew up fishing with my family in and around the barrier islands off the Louisiana coast. To paraphrase Tab Benoit, a very wise Houma native, activist, and musician, "The only way to save the wetlands is to bring Americans, as a whole, to a realization of how precious the south Louisiana coastline is to our beautiful

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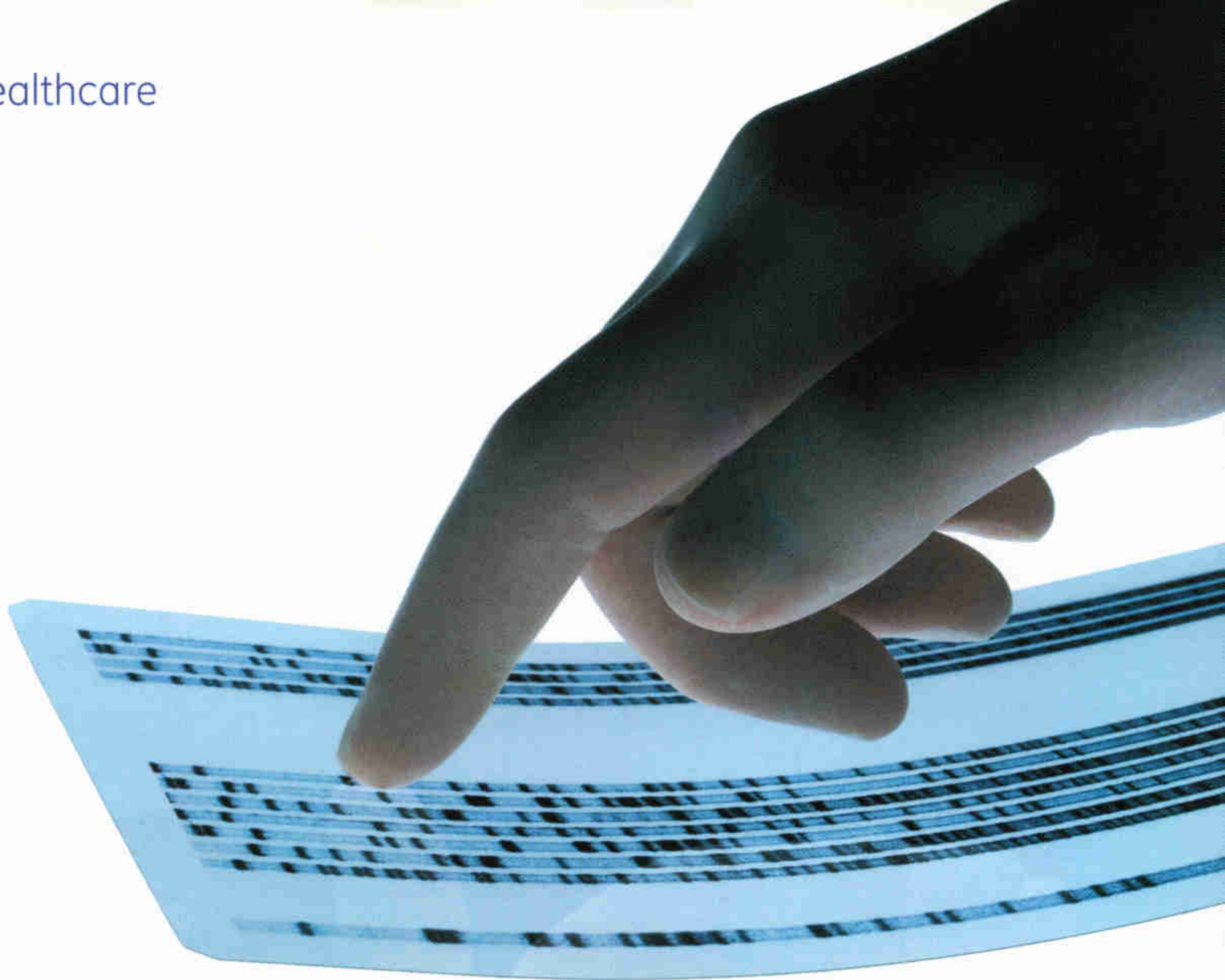
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imagination at work

Zip: Elko, Nevada

In the past few years northern Nevada has experienced raging fires and severe drought. It continually struggles with Feds over grazing rights, with the waste industry over illegal dumping of hazardous materials, with the state for what is left of the aquifer, and with the mining industry for leaving a trail of EPA-rated contamination sites. Romantic pictures of cowboys and descriptions of old pickup trucks play to the critically thin theme of good ole boys and the good ole days.

MARY ANN BONJONI
Austin, Nevada

I am not familiar with tintype photography, but I noticed the pictures were printed backward. Is this normal?

EDWARD AGIUS
San Bruno, California

Many readers wrote in about the backward appearance of the tintypes. As mentioned in the October issue, after processing, the resulting images appear as mirror images of the subject.

On Assignment

I read with interest "Reflections on Tintypes" as I have a tintype of my grandfather, a deputy who was killed in the line of duty on Christmas Day 1906. I can picture the grandfather I never knew sitting patiently while the photographer fixed the image, then dried and varnished it to preserve it. And preserve it he did, as almost a hundred years later it sits proudly with other images of my ancestors.

MARTHA RIEBE
Harkers Island, North Carolina



ROBB KENDRICK

In "Shooting the Old-Fashioned Way," Robb Kendrick referred to learning how to make tintypes from "a guy in upstate New York who had given up everything to do tintypes." This man, who "lives in a cabin with no water or electricity," is our neighbor John Coffey. John's devotion to learning and teaching early photography methods has attracted many students who share his enthusiasm.

MARY GEO TOMION
Dundee, New York

and diverse country." For this I am ever so grateful to NATIONAL GEOGRAPHIC.

ELLEN BURLEIGH COOK
Madison, Wisconsin

FROM OUR ONLINE FORUM
nationalgeographic.com/magazine/0410

How ironic that Louisiana's vanishing marsh has been protecting the petroleum infrastructure from the storm surges and hurricanes that the oil industry is exacerbating in the first place!

MEG PUTTRE
Ouray, Colorado

I bet none of our politicians know what it feels like to have to raise everything important off the floor every time the tide comes up or a hurricane even thinks of coming to Louisiana. I bet they'll never know what it's like to sweep water and mud out of their homes at least once a year. We are tired of being ignored.

LORI ROWLEY
Houma, Louisiana

FROM OUR ONLINE FORUM
nationalgeographic.com/magazine/0410

Kogi of Colombia

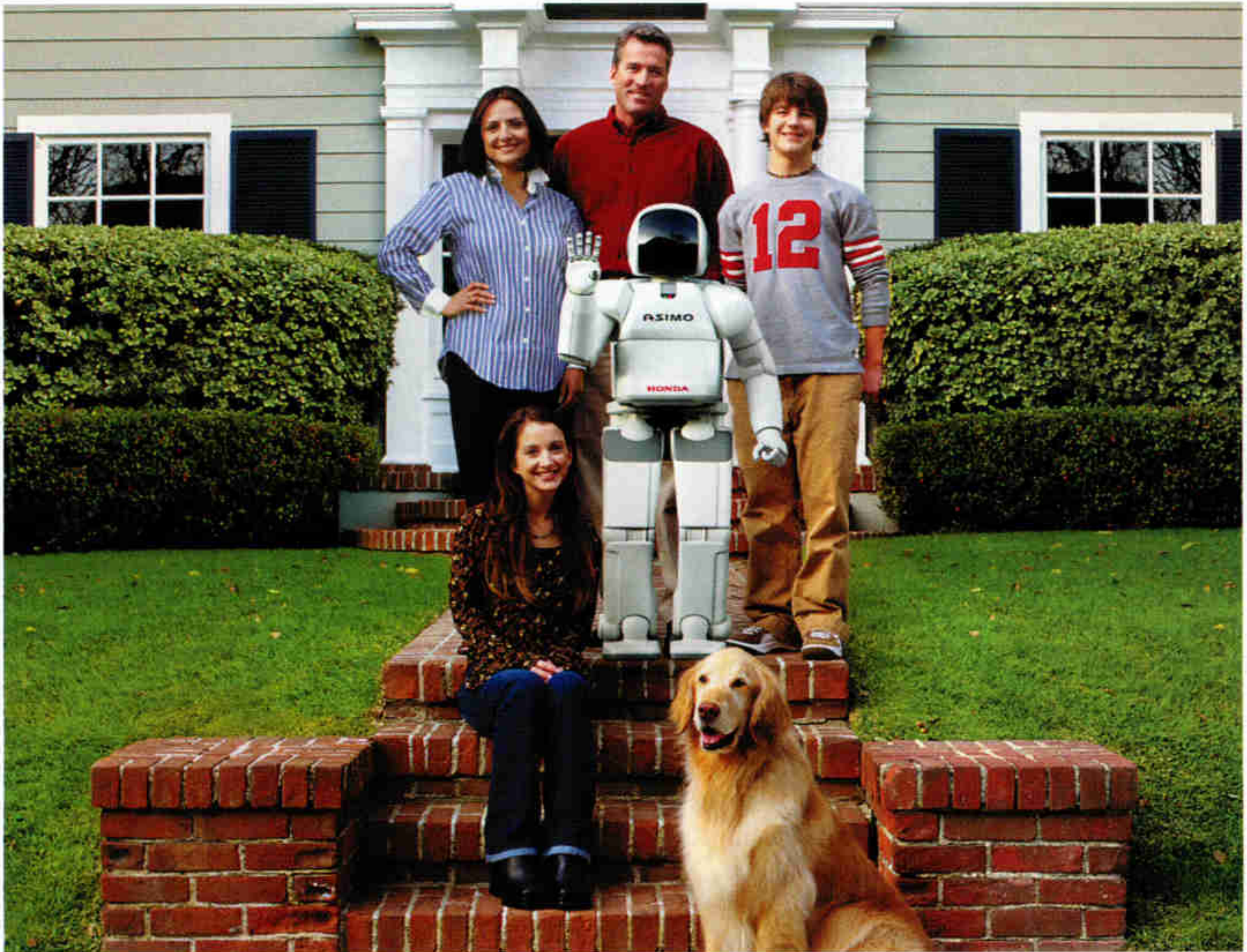
Reading your article made me wonder what can be done to help these people. It is rare that we see the faces of people who are so beautiful and at peace with themselves and the world. Thank you for sharing them.

DONNA PRESSLEY
Hollywood, Florida

Your July story titled "Cocaine Country" and this month's "Keepers of the World" only serve to prove one point: Your complete and utter inability to produce a nuanced and in-depth analysis of the extremely complex sociopolitical realities of a country like Colombia. This month you give us a hopelessly romanticized view of the indigenous peoples of the Sierra Nevada de Santa Marta. This is not to say that the beliefs of the Kogi, Arhuaco, Wiwa, and Kankuamo should not be taken seriously, only that the reality of indigenous groups and, in fact, all of the Colombian population is far more complex given the past 50 years of violence and internal conflict.

SANTIAGO GIRALDO
Bogotá, Colombia

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We're building a dream, one robot at a time.

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The future of this exciting technology is even more promising. ASIMO has the potential to respond to simple voice commands, recognize faces, carry loads and even push wheeled objects. This means that, one day, ASIMO could be quite useful in some very important tasks. Like assisting the elderly, and even helping with household chores. In essence, ASIMO might serve as another set of eyes, ears and legs for all kinds of people in need.

All of this represents the steps we're taking to develop products that make our world a better place. And in ASIMO's case, it's a giant step in the right direction.

HONDA
The Power of Dreams

Arctic Fox

I would like to tip my hat to Norbert Rosing on his outstanding photography. During my career as a heavy equipment operator, I have worked much of the far north and have seen many winter sights, but when I looked at the picture on pages 78-9, it actually made me shiver. I can see that in the future any viewing of winter pictures taken by Rosing will have to be done with my parka on!

BARRIE BLAKE
Maple Ridge, British Columbia

Red Hot Hawaii

Our visit to the Hawai'i Volcanoes National Park in April 2004 provoked an epiphany. Looking at the seismometers displayed at the Jaggar Museum, we noted the level of constant

seismic activity in and around Kīlauea Caldera, where many visitors spend time never thinking about what might be going on under their feet. After we witnessed live lava below Pu'u 'Ō'ō, the museum display suddenly brought home to us that an eruption could conceivably happen in the park anytime and anywhere. Sobering thought.

PAM AND RAY PRAMUKA
Norwalk, Connecticut

From the Editor/ A Special Message

Thanks so much for the Editor's message regarding the faked photographs. Accidents and mistakes happen, and publications can be misled by photographers and writers alike. But it is how a publication responds to such situations that dem-

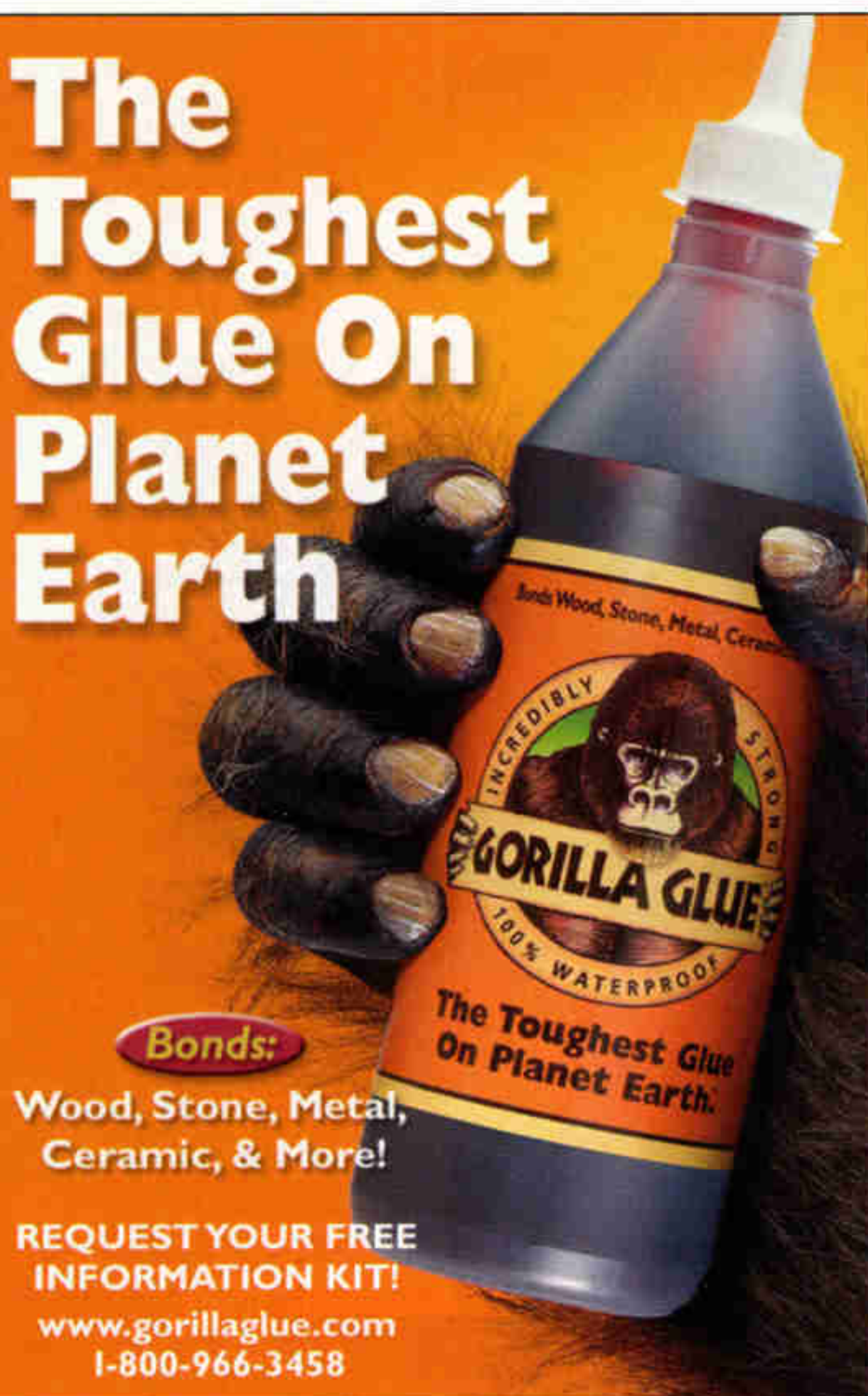
onstrates its true strength and integrity. Very classy and admirable. Precisely what I expect from you.

ROBERT J. BORHART
Elk River, Minnesota

Behind the Scenes

I was so excited to see the story on my hero Mike Fay and his new expedition, the Africa Megaflyover with pilot Peter Ragg. I was, however, disappointed that even though the support of the Wildlife Conservation Society and National Geographic were mentioned, the involvement of the South African group the Bateleurs (Peter Ragg's group, and one in which Mike himself is a member) was not. The importance of these dedicated pilots, who donate their time and skill to provide conservationists

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with a bird's-eye view of the land they are protecting, is great and should not be overlooked.

AMANDA GOMM
Toronto, Ontario

Geographica: The Wolf Effect

The idea that putting the wolves back into the ecosystem because it is good for the plants isn't new. For more than 50 years now, Allan Savory, land manager and author of *Holistic Management*, has been working to get people to understand that ungulates, pack-hunting predators, soils, and plants evolved together. By removing the predator, the functioning "whole" breaks down—the ungulates overpopulate, change their behavior, cease trampling, and overgraze plants that cannot stand the pressure.

Without the natural herd movements, the same plant communities eventually "rest to death."

SHANNON HORST
Albuquerque, New Mexico

It is heartening to see that Yellowstone's ecological health is benefiting from wolves. Soon we may find that the elk are also healthier. The culling of sick animals by wolves will suppress the mad-cow-type wasting disease that afflicts western deer and elk. Inuit legend holds that the Creator provided caribou to feed the people and then created wolves to keep the caribou healthy.

MICHAEL MALLARY
Sterling, Massachusetts

Flashback

From the time I was a small

child, we had a framed copy of Audubon's "Ivory-billed Woodpeckers" hanging in the living room. You can imagine my excitement when, at the age of 14, I saw a pair of ivorybills at Iroquois Park in Louisville, Kentucky. The year was 1959. Unfortunately for me, the woodpeckers, and the world, the golf course expanded to 18 holes and their tree was cut down. I never saw or heard these wonderful creatures again.

THOMAS S. DENTON
Hattiesburg, Mississippi

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G E O G R

T H E P E O P L E , P L A C E S , A N D

GLOBAL ECONOMY

A World of Parts

It's a big job to build a Mini

Thomas Schmid can be excused for drifting off to sleep at night with visions of auto parts dancing in his head. As the purchasing director for the Mini brand of the BMW Group, he spends his days searching the world for companies to supply the nearly 2,500 parts—from engines to windshield wipers—that finally come together to produce each distinctively stubby car at the company's Oxford, England, assembly plant.

As recently as the early 1990s Schmid might not have needed to look past Europe to find parts. But over the past decade increases in financial pressures, technical requirements, and global vehicle production have forced many automakers to broaden their horizons. "One way to stay competitive is to find low-cost parts, wherever they are," says John Casesa, an auto industry analyst for Merrill Lynch. "It's about car companies needing to find the best parts at the best prices."

As BMW prepared for the 2001 launch of the new Mini—the original car bearing that name had been produced by the British Motor Corporation from 1959 until 2000—Schmid and his colleagues cast a wide net for parts makers. Today their supply chain includes companies based in the Americas, Asia, and Europe. But determining a part's provenance is more complicated than simply identifying its country of origin.



Grille

Made in: **Germany**

Company headquarters: **Germany**

Hood

Made in: **Netherlands**

Company headquarters: **Austria**

Gasoline engine

Made in: **Brazil**

Company headquarters: **Brazil**

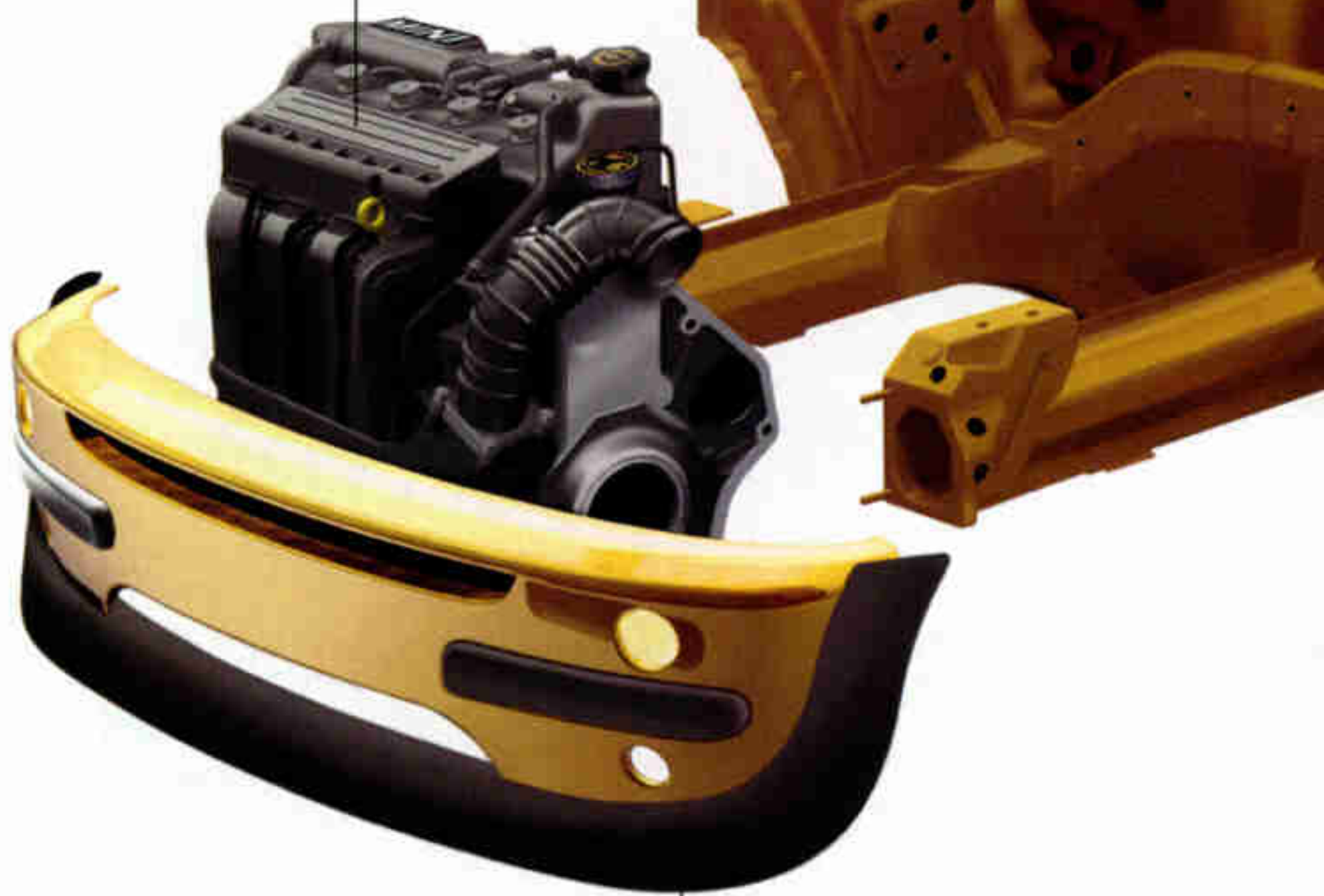
Tritec Motors puts the vroom under the Mini's hood. A BMW-Chrysler joint venture, it supplies engines for some DaimlerChrysler models.

Diesel engine

(not shown)

Made in: **Japan**

Company headquarters: **Japan**



Front and rear bumpers

Made in: **U.K.**

Company headquarters: **Canada**



Icon of the 1960s British automobile industry, the old Mini was once a favorite ride of all four of the Beatles. Now German carmaker BMW owns the brand and since 2001 has produced a new Mini (left) in England with parts from companies based around the world.

APHICA

C R E A T U R E S O F O U R U N I V E R S E

Windshield

Made in: **Belgium**

Company headquarters: **France**

The Mini's windshield maker, Saint-Gobain, traces its roots to Louis XIV, who helped create the glass firm in 1665 to boost the French economy.

Headliner

Made in: **U.K.**

Company headquarters: **Spain**

Outside mirrors

Made in: **Germany**

Company headquarters: **Canada**

Seats

Made in: **U.K.**

Company headquarters: **U.S.**

Before Johnson Controls made seats for cars, it specialized in heat for houses; its founder patented the electric room thermostat. Today the firm makes the Mini's seats—some with built-in heaters.

Exhaust system

Made in: **U.K.**

Company headquarters: **U.S.**

Wheel bearings

Made in: **U.K.**

Company headquarters: **U.S.**

Wheels

Made in: **Italy, Germany**

Company headquarters: **U.S.**

Where do the pieces really come from?

A selection of the Mini's parts reveals the popular little car's complicated global pedigree. Automakers are increasingly turning to international outsourcing to remain competitive. The growing complexity of car designs means there are more parts to find. The Mini's own 250 available options—from chrome-plated roll bars to rain sensors that automatically start the windshield wipers—allow for some 50,000 unique configurations.

ART BY IGNACIO AYESTARAN



BARKER EVANS PHOTOGRAPHY

Even for Schmid it's difficult to pin down all the nations ultimately involved in the car's long supply chain. Market prices of commodities may vary according to everything from weather to global politics; for any given Mini production run, parts made from these resources are apt to come from whatever country is producing them best and cheapest at the time.

To reduce costs further, Mini insists that suppliers deliver only enough parts to the Oxford plant to build the 600-some cars moving through the assembly line (above) in a day. For suppliers like the Canadian firm Intier, this means maintaining a factory near Oxford in order to deliver its cockpits (units that include dashboard and steering column) on time.

So what do you call a car built in Britain by a German company using parts from—in one way or another—dozens of other countries? "Since the demand for the Mini continues to outstrip the supply," says John Casesa, "as far as the buying public is concerned, it's called a success."

—Peter Gwin

Driving the Economy

Countries all over the world are gearing up their manufacturing to take advantage of expected new markets for automobile sales—in their own backyards. Some below may soon need more roads and fresh sources of fuel.

Projected Annual Sales for Cars and Light Commercial Vehicles

United States

2005: 17,048,000

2010: 17,796,000

China

2005: 5,022,000

2010: 7,312,000

Brazil

2005: 1,564,000

2010: 1,937,000

India

2005: 1,353,000

2010: 2,373,000

South Korea

2005: 1,240,000

2010: 1,693,000

SOURCE: GLOBAL INSIGHT, INC.

WEBSITE EXCLUSIVE Find links and resources selected by our Research Division at nationalgeographic.com/magazine/0502.

GEO NEWS

DEMOGRAPHICS

■ **Miami, Florida, has the largest percentage of immigrants of any city on Earth.** A United Nations report states that 59 percent of the city's residents are foreign-born. Many of the new Miamians hail from Caribbean nations as well as from Central and South America.

EXTINCTIONS

■ **Nearly one-third of the world's amphibians are threatened by extinction.** According to an international survey, 1,856 out of the 5,743 known species of amphibians are at risk. Since 1980 at least nine species have become extinct; another 113 species have not been seen in the wild and may also be permanently gone.

MEDICINE

■ **Duct tape can cure the common wart.** In a controlled study, 85 percent of patients who followed a specific regimen of applying duct tape to warts experienced complete resolution of the lesions. Just 60 percent of patients treated with cryotherapy—freezing warts with liquid nitrogen—had similar results.

HISTORY

■ **Will the real George Washington please stand up?** Three highly accurate life-size models of the first President of the United States—at age 19, 45, and 57—are being constructed by scientists using forensic medical analysis, computer scanning, and descriptions by his contemporaries. The Georges will go on display next year in a new education center planned for Mount Vernon, Washington's Virginia home.

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**Introducing
Our 2005
Emerging
Explorers**



Constanza Ceruti

An anthropologist and specialist in the field of high-altitude archaeology, Constanza uncovers the mysteries of Inca ceremonial centers on the summits of the Andean mountains.



Tim Samaras

An avid storm chaser, Tim speeds into the path of tornadoes to deploy a probe that measures meteorological conditions. Then, he gets out of the way as fast as he can.



Kira Salak

The writer that the *New York Times* called a "real-life Lara Croft," Kira has kayaked West Africa's Niger River solo for 600 miles, cycled across Alaska, and was the first woman to cross Papua New Guinea.

Visit nationalgeographic.com/emerging to see and hear the Emerging Explorers.

Where will a new generation take exploration?

WHO WILL FORGE THE FUTURE'S NEXT GREAT DISCOVERIES, INVENTIONS, SOLUTIONS, AND ADVENTURES? *Emerging Explorers*, an ongoing National Geographic Mission program, scouts the globe for those trailblazers and helps them realize their potential. The 2005 grantees have already made important and exciting contributions in a wide range of fields. As their careers unfold, so does a world of new possibilities.



Andrew Zolli

Andrew is a futurist whose forecasts blend research, technology, and creativity to help people and institutions respond to complex change.



Constance Adams

A space architect, Constance specializes in human-friendly designs ranging from Mars surface habitats to the *Next-Generation* space shuttle.



Jenny Daltry

A herpetologist and snake wrangler, Jenny has waded into unexplored rivers and swamps to save the endangered Siamese crocodile and document venomous snakes.

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Every field has them: fearless pioneers whose insatiable curiosity and imagination erase old boundaries. Since 2003, the National Geographic Emerging Explorers Program has identified and provided support to these ascending talents as they embark on careers full of promise and potential.



Exploration is one of the pillars of the National Geographic Society, and our 2005 class of Emerging Explorers reflects an exciting evolution in how "exploration" is defined. Cornerstones such as archaeology and anthropology are represented, but so are space architects, futurists, storm chasers, snake wranglers, and adventurers. Joining the elite ranks of Emerging Explorers from 2003 and 2004, these new grantees will grapple with challenges in a broader range of fields than ever before.

Recognizing the crucial role technology plays in exploration, Microsoft has supported the Emerging Explorers Program since its inception and is proud to continue that commitment. In the months to come, look for Microsoft to bring you profiles of each of the 2005 Emerging Explorers in *National Geographic* magazine. With Microsoft's help, an extraordinary new generation of explorers will realize their potential, challenge convention, and carry exploration in undreamed of new directions.

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Mission Programs

Emerging Explorers from 2004
Top: Jimmy Chin, Climber/Photographer
Middle: Spencer Wells, Geneticist/Anthropologist
Bottom: Tierney Thys, Marine Biologist

Visit nationalgeographic.com/emerging to see and hear the Emerging Explorers.

THE GEOGRAPHY OF EVERYDAY LIFE



Muslims in America

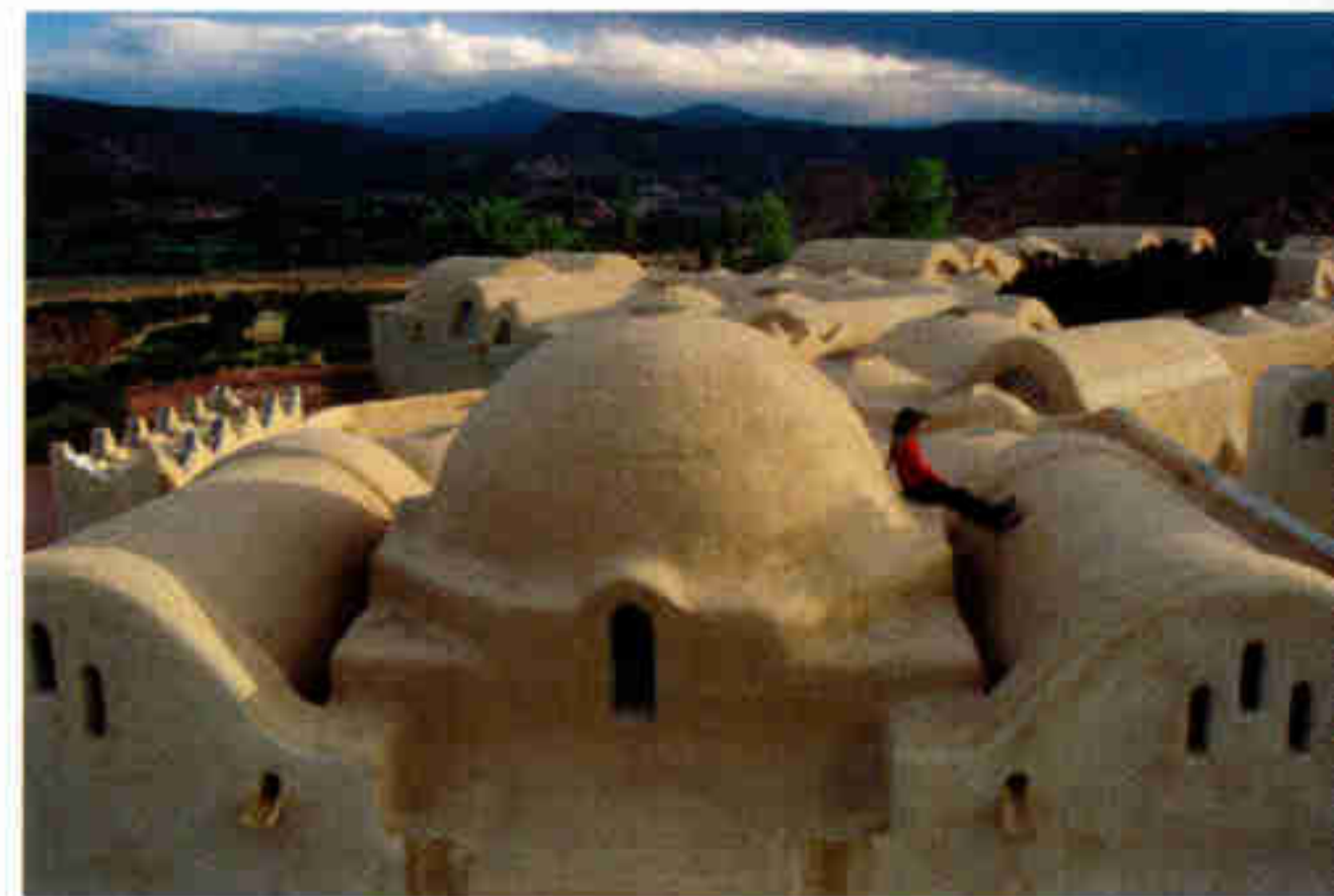
Since September 11, 2001, when Islamist terrorists attacked the United States, a big spotlight—or a galaxy of small ones—has been shining on Muslims. Yet all this light has not helped illuminate a seemingly simple question: How many Muslims live here?

Getting a reliable head count in the U.S. is difficult because federal law prohibits the Census Bureau from asking questions about religion. Without a comprehensive tally, social scientists use surveys, but results are all over the map. One study by the Council on American-Islamic Relations identified 1,209 mosques—including Dar al Islam's education center in

New Mexico (right)—estimated the average attendance, then calculated a national total. Using this method, the council estimates that there are six million to seven million Muslims in the U.S. Most academics, though, put the population closer to two to three million. (In Canada, where the census does track religious affiliation, there are 579,600 Muslims, or 2 percent of the population.)

Whatever the figure, the U.S. undoubtedly has one of the world's most ethnically diverse Muslim communities (left). Most Islamic immigrants from South Asia and the Middle East are Muslim from birth, whereas most African-American Muslims are converts or "reverts"—the spiritual descendants of Africans whose Islamic roots were severed long ago by the slave trade.

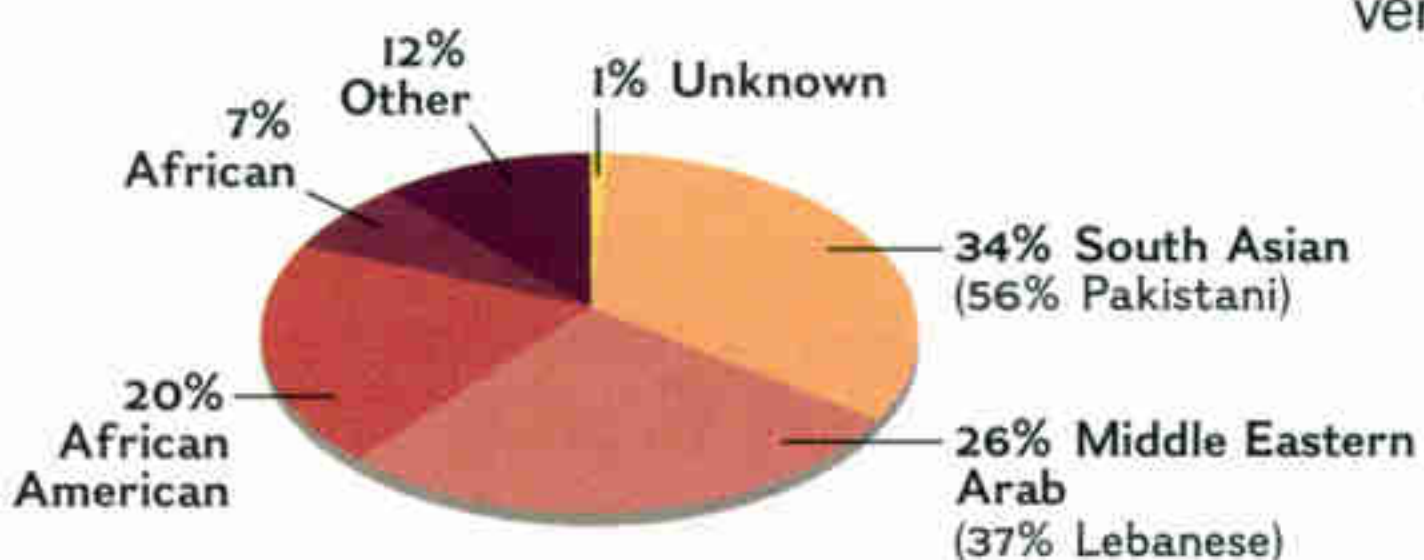
Although this diversity creates some tensions, it also presents historic opportunities, says



ALEXANDRA AVAKIAN, CONTACT PRESS

Muqtadar Khan, an Indian immigrant and author of *American Muslims: Bridging Faith and Freedom*. African-American Muslims tend to focus on domestic issues such as racism and economic justice, Khan says, while immigrants care more about life back home. Yet despite the differences, "the American Muslim community believes that it has a divine mission"—to show that Islamic values are relevant to modern life. If Muslims do that, he says, they can influence the West and "reshape the destiny of traditional Muslim societies."

—Alan Mairson



Ethnic composition of the Muslim community in the U.S.

LINGUISTICS

Fighting Words

Tracking the *janjaweed*

Before the word *janjaweed* became the latest term of terror—a reference to the government-backed militiamen (right) ravaging western Sudan's Darfur region—it was no more than a colloquial insult. Parents scolded misbehaving children by calling them *janjaweed*, and locals branded thuggish behavior with the term.

But words have a way of morphing with the times, and this one has. The origin of the term is now often attributed to the Arabic words *jinn*, “demon,” and *jawad*, “horse,” yet some linguists disagree with that explanation. Elizabeth Bergman, a scholar of Arabic dialects, says “Arabic words aren't typically formed



ESPEN RASMUSSEN, AFP/GETTY IMAGES

that way.” Whether the word comes from Arabic or not, victims of Darfur's militiamen have begun applying it to any Arab who threatens them.

In fact the government in Khartoum has been conducting a long-running campaign to Arabize Sudan. In Darfur tensions over land and water resources run high and have been exacerbated by decades of drought. This has led to further conflict between

herders, who are predominantly Arab, and farmers, who are mostly African. The militia have destroyed hundreds of the farmers' towns and villages, displacing more than a million people and taking tens of thousands of lives.

These paramilitary bands reject the label *janjaweed*. Instead, they call themselves border guards, reconnaissance brigades, even *mujahideen*—holy warriors.

—Naomi Schwarz

GEO QUIZ

Marriage

Engage yourself in these questions about commitment customs and celebrations around the world.

1. Of Alabama, West Virginia, California, and New York, which state prohibits marriage between first cousins?
2. In Berber culture, which internal organ is considered to be the embodiment of love?

3. What color is a traditional Chinese wedding dress? Why?
4. Name the traditional circle dance often performed at Jewish weddings.
5. Suttee refers to what Hindu practice illegal in India?
6. What two countries were the first to legalize same-sex marriages?
7. In traditional Hopi culture, how does a woman propose to a potential husband?
8. What vows do a bride and groom make during a Thai Buddhist wedding?
9. Name the Greek goddess of women and marriage whose temple in Italy is pictured at left.
10. Which U.S. state was last to remove language banning interracial marriage from its laws?
11. Why is a Masai bride warned not to look back when she leaves for her new husband's home?

12. What does the symbolic marriage of young girls to the Hindu god Vishnu prevent, according to the Newar people of Nepal?
13. How many weddings take place in Las Vegas, Nevada, each year?
14. Name three ancient cultures in which royal marriages between brothers and sisters were common practice.
15. At what point is marriage finalized for members of Africa's Ndzundza Ndebele tribe?
16. Whose presence at a Catholic wedding was required by the Council of Trent in 1563?
17. What do brides in Greece write on the soles of their wedding shoes?
18. Who conducts a Quaker wedding ceremony?

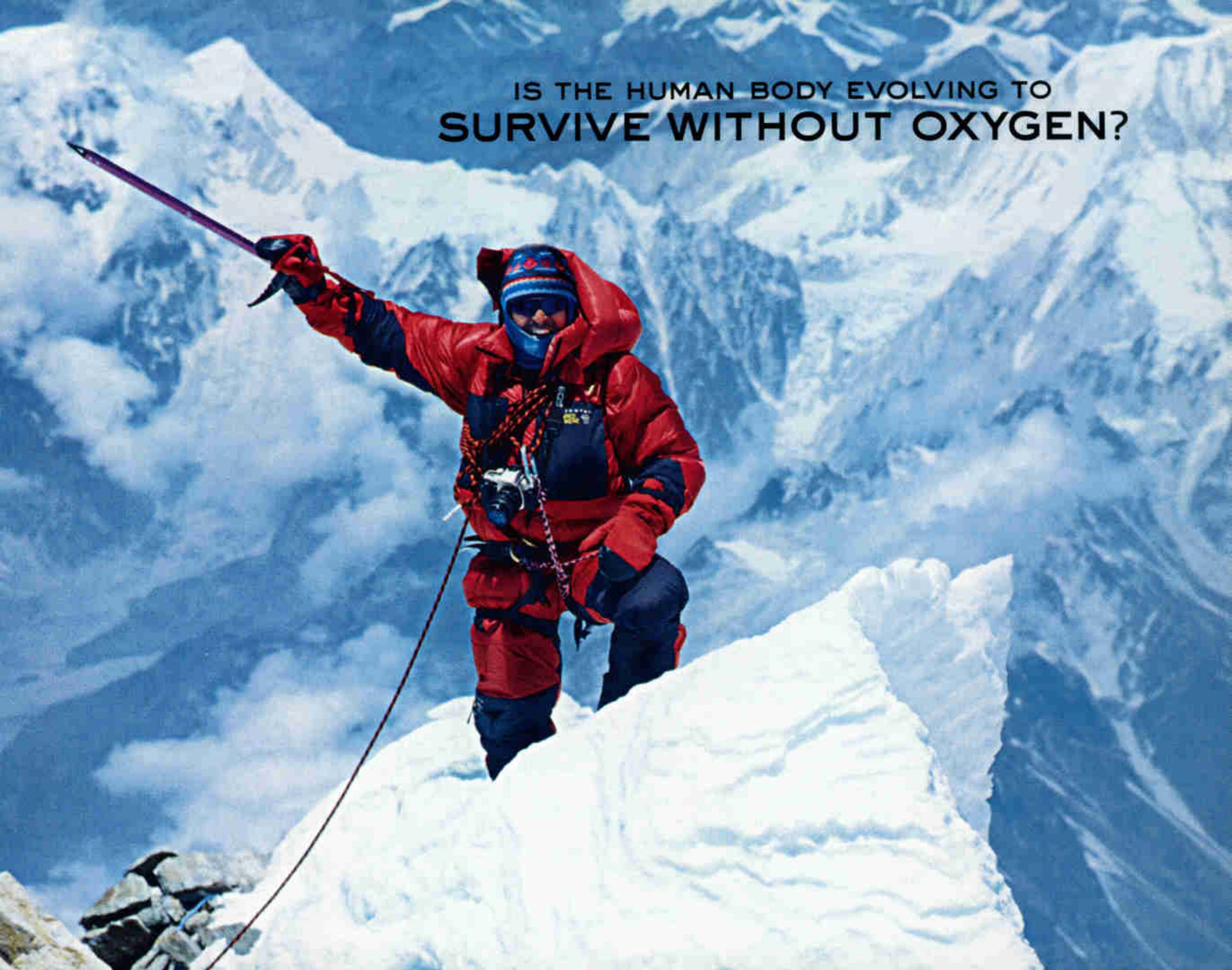
—Siobhan Roth
and Jackie Pysarchuk



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1. WEST VIRGINIA 2. THE LIVER 3. RED; IT REPRESENTS LUCK AND HAPPINESS 4. THE HORA 5. A WIDOW'S IMMOLATION ON HER HUSBAND'S FUNERAL PYRE 6. THE NETHERLANDS IN 2001 AND BELGIUM IN 2003 7. SHE BAKES BREAD, IF HE ACCEPTS IT, THEY'RE ENGAGED 8. NONE 9. HERA 10. ALABAMA IN 2000 (U.S. SUPREME COURT INVALIDATED ALL STATE BANS IN 1967) 11. SHE IS TOLD SHE'LL TURN TO STONE 12. STIGMA OF WIDOWHOOD OR DIVORCE 13. MORE THAN 100,000 14. INCA, EGYPTIAN, AND HAWAIIAN SOCIETIES 15. WITH THE BIRTH OF A CHILD 16. PRIEST AND WITNESSES 17. NAMES OF UNMARRIED FRIENDS: THOSE THAT RUB OFF WILL BE NEXT TO MARRY 18. THE BRIDE AND GROOM

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Ed Viesturs was hailed by National Geographic as one of the strongest high-altitude mountaineers on Earth. He's gazed from the summit of Mt. Everest five times. Three of those times he pushed to the top without supplemental oxygen. A feat few people in the world will ever accomplish. In Ed Viesturs' own words: "Getting to the top is optional, but getting down is mandatory." He plans to climb all 14 of the world's highest peaks without oxygen. So far: 13 down, one more to go. There are exceptional explorers on this planet, but there is only one Ed Viesturs.



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GEOLOGY

Fire and Ice

Do northern winters rouse volcanoes worldwide?

When snowfall builds north of the Equator, things start to heat up underground. Winter, according to a Cambridge University study, is volcano season.

One of the study's authors, Ben Mason, stumbled upon the seasonal link as an undergrad. Entering thousands of eruption dates into a computer, he noticed "significantly more were in December, January, and February," he says. Mason and his colleagues then analyzed all worldwide eruptions over the past 300 years (this 1994 satellite image shows the Klyuchevskaya volcano's ash plume darkening skies over Russia's Kamchatka Peninsula). Their conclusion was explosive: Volcanoes in both hemispheres erupt 18 percent more often during the Northern Hemisphere's winter.

The geologists attribute this increase in activity to the water cycle, which each winter dumps more than ten trillion tons of

seawater as snow, rain, and ice on Earth's landmasses, most of which are located in the north. The seasonal burden depresses the North Pole by a tenth of an inch and swells the Equator slightly—which warps the Earth enough, they believe, to help move magma up and out.

"Now that we're aware of the link between seasonal weather and volcanic activity," says Mason, "we should consider how global warming and sea level change may affect eruptions."

—Scott Elder



moving forward ▶

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My Seven



On the Civil Rights Trail

Charles E. Cobb, Jr. *Author and journalist*

Charlie Cobb knew the civil rights movement firsthand. In the 1960s he worked for the movement in Mississippi. He later became a NATIONAL GEOGRAPHIC writer and is now a correspondent at *allAfrica.com*. His upcoming book on places crucial to the civil rights cause includes the following—"not just the usual places," he says, "but ones important to history, and to me."

1 **Lincoln Memorial, Washington, D.C.**

Marian Anderson gave her famous 1939 concert here after being denied the use of Constitution Hall because she was black. During the 1963 March on Washington, Martin Luther King, Jr., delivered his "I Have a Dream" speech on the memorial steps.

2 **Moton High School, Farmville, Va.**

In 1951 students here staged a walkout to protest the deplorable condition of their segregated black school. Their protest, and others, led to the 1954 Supreme Court decision forcing school desegregation.



NGS PHOTOGRAPHER MARK THIESSEN (TOP LEFT); JACK MOEBES, CORBIS (ABOVE); CSU ARCHIVES/EVERETT COLLECTION

3 **Woolworth's, Greensboro, N.C.**

When four college students were refused service at Woolworth's lunch counter February 1, 1960, their sit-in (above) spread across the South. An international civil rights center opens here later this year.

4 **Penn Center, St. Helena Island, S.C.**

Site of one of the country's first schools for freed slaves (1862), this was also

a place of retreat for Martin Luther King, Jr. Now it's an educational center preserving Sea Islands history and Gullah culture.

5 **Highlander Center, New Market, Tenn.**

Since 1932 the center has trained activists to find "the courage and ability to confront reality and change."

6 **Greenwood, Miss.**

The '60s voting rights campaign in

the Mississippi Delta began to unfold here.

7 **Highway 80, Selma to Montgomery, Ala.**

The 1965 march (lower left) along this route focused national attention on the movement and helped ensure the passage of the Voting Rights Act.

I HAVE A DREAM

In the forum: Tell us how the civil rights movement has had an impact on you at nationalgeographic.com/magazine/0502.



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IMPORTANT INFORMATION: SINGULAIR will NOT replace fast-acting inhalers for sudden symptoms. You should still have rescue medication available and continue to take your other asthma medications unless your doctor tells you to stop. If your doctor has prescribed a medicine for you to use before exercise, keep using that medicine unless your doctor tells you not to. If your asthma symptoms get worse or you need to increase the use of your rescue inhaler, call your doctor at once.

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(MONTELUKAST SODIUM)

A simple way to help control asthma.



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Patient Information
SINGULAIR® (SING-u-lair) Tablets, Chewable Tablets, and Oral Granules
Generic name: montelukast (mon-te-LOO-kast) sodium

9094217

Read this information before you start taking SINGULAIR®. Also, read the leaflet you get each time you refill SINGULAIR, since there may be new information in the leaflet since the last time you saw it. This leaflet does not take the place of talking with your doctor about your medical condition and/or your treatment.

What is SINGULAIR®?

- SINGULAIR is a medicine called a leukotriene receptor antagonist. It works by blocking substances in the body called leukotrienes. Blocking leukotrienes improves asthma and seasonal allergic rhinitis (also known as hay fever). SINGULAIR is not a steroid.

SINGULAIR is prescribed for the treatment of asthma and seasonal allergic rhinitis:

1. Asthma.

SINGULAIR should be used for the long-term management of asthma in adults and children ages 12 months and older.

Do not take SINGULAIR for the immediate relief of an asthma attack. If you get an asthma attack, you should follow the instructions your doctor gave you for treating asthma attacks. (See the end of this leaflet for more information about asthma.)

2. Seasonal Allergic Rhinitis.

SINGULAIR is used to help control the symptoms of seasonal allergic rhinitis (sneezing, stuffy nose, runny nose, itching of the nose) in adults and children ages 2 years and older. (See the end of this leaflet for more information about seasonal allergic rhinitis.)

Who should not take SINGULAIR?

Do not take SINGULAIR if you are allergic to SINGULAIR or any of its ingredients.

The active ingredient in SINGULAIR is montelukast sodium.

See the end of this leaflet for a list of all the ingredients in SINGULAIR.

What should I tell my doctor before I start taking SINGULAIR?

Tell your doctor about:

- **Pregnancy:** If you are pregnant or plan to become pregnant, SINGULAIR may not be right for you.
- **Breast-feeding:** If you are breast-feeding, SINGULAIR may be passed in your milk to your baby. You should consult your doctor before taking SINGULAIR if you are breast-feeding or intend to breast-feed.
- **Medical Problems or Allergies:** Talk about any medical problems or allergies you have now or had in the past.
- **Other Medicines:** Tell your doctor about all the medicines you take, including prescription and non-prescription medicines, and herbal supplements. Some medicines may affect how SINGULAIR works, or SINGULAIR may affect how your other medicines work.

How should I take SINGULAIR?

For adults or children 12 months of age and older with asthma:

- Take SINGULAIR once a day in the evening.
- Take SINGULAIR every day for as long as your doctor prescribes it, even if you have no asthma symptoms.
- You may take SINGULAIR with food or without food.
- If your asthma symptoms get worse, or if you need to increase the use of your inhaled rescue medicine for asthma attacks, call your doctor right away.
- **Do not take SINGULAIR for the immediate relief of an asthma attack.** If you get an asthma attack, you should follow the instructions your doctor gave you for treating asthma attacks.
- Always have your inhaled rescue medicine for asthma attacks with you.
- Do not stop taking or lower the dose of your other asthma medicines unless your doctor tells you to.
- If your doctor has prescribed a medicine for you to use before exercise, keep using that medicine unless your doctor tells you not to.

For adults and children 2 years of age and older with seasonal allergic rhinitis:

- Take SINGULAIR once a day, at about the same time each day.

- Take SINGULAIR every day for as long as your doctor prescribes it.
- You may take SINGULAIR with food or without food.

How should I give SINGULAIR oral granules to my child?

Do not open the packet until ready to use.

SINGULAIR 4-mg oral granules can be given either:

- directly in the mouth;
- OR
- mixed with a spoonful of one of the following soft foods at cold or room temperature: apple-sauce, mashed carrots, rice, or ice cream. Be sure that the entire dose is mixed with the food and that the child is given the entire spoonful of the mixture right away (within 15 minutes).

IMPORTANT: Never store any oral granule/food mixture for use at a later time. Throw away any unused portion.

Do not put SINGULAIR oral granules in liquid drink. However, your child may drink liquids after swallowing the SINGULAIR oral granules.

What is the daily dose of SINGULAIR for asthma or seasonal allergic rhinitis?

For Asthma (Take in the evening):

- One 10-mg tablet for adults and adolescents 15 years of age and older,
- One 5-mg chewable tablet for children 6 to 14 years of age,
- One 4-mg chewable tablet or one packet of 4-mg oral granules for children 2 to 5 years of age, or
- One packet of 4-mg oral granules for children 12 to 23 months of age.

For Seasonal Allergic Rhinitis (Take at about the same time each day):

- One 10-mg tablet for adults and adolescents 15 years of age and older,
- One 5-mg chewable tablet for children 6 to 14 years of age, or
- One 4-mg chewable tablet or one packet of 4-mg oral granules for children 2 to 5 years of age.

What should I avoid while taking SINGULAIR?

If you have asthma and if your asthma is made worse by aspirin, continue to avoid aspirin or other medicines called non-steroidal anti-inflammatory drugs while taking SINGULAIR.

What are the possible side effects of SINGULAIR?

The side effects of SINGULAIR are usually mild, and generally did not cause patients to stop taking their medicine. The side effects in patients treated with SINGULAIR were similar in type and frequency to side effects in patients who were given a placebo (a pill containing no medicine).

The most common side effects with SINGULAIR include:

- stomach pain
- stomach or intestinal upset
- heartburn
- tiredness
- fever
- stuffy nose
- cough
- flu
- upper respiratory infection
- dizziness
- headache
- rash

Less common side effects that have happened with SINGULAIR include (listed alphabetically): agitation including aggressive behavior, allergic reactions (including swelling of the face, lips, tongue, and/or throat, which may cause trouble breathing or swallowing), hives, and itching, bad/vivid dreams, increased bleeding tendency, bruising, diarrhea, drowsiness, hallucinations (seeing things that are not there), hepatitis, indigestion, inflammation of the pancreas, irritability, joint pain, muscle aches and muscle cramps, nausea, palpitations, pins and needles/numbness, restlessness, seizures (convulsions or fits), swelling, trouble sleeping, and vomiting.

Rarely, asthmatic patients taking SINGULAIR have

experienced a condition that includes certain symptoms that do not go away or that get worse. These occur usually, but not always, in patients who were taking steroid pills by mouth for asthma and those steroids were being slowly lowered or stopped. Although SINGULAIR has not been shown to cause this condition, **you must tell your doctor right away if you get one or more of these symptoms:**

- a feeling of pins and needles or numbness of arms or legs
- a flu-like illness
- rash
- severe inflammation (pain and swelling) of the sinuses (sinusitis)

These are not all the possible side effects of SINGULAIR. For more information ask your doctor or pharmacist.

Talk to your doctor if you think you have side effects from taking SINGULAIR.

General Information about the safe and effective use of SINGULAIR

Medicines are sometimes prescribed for conditions that are not mentioned in patient information leaflets. Do not use SINGULAIR for a condition for which it was not prescribed. Do not give SINGULAIR to other people even if they have the same symptoms you have. It may harm them. **Keep SINGULAIR and all medicines out of the reach of children.**

Store SINGULAIR at 25°C (77°F). Protect from moisture and light. Store in original package.

This leaflet summarizes information about SINGULAIR. If you would like more information, talk to your doctor. You can ask your pharmacist or doctor for information about SINGULAIR that is written for health professionals.

What are the ingredients in SINGULAIR?

Active ingredient: montelukast sodium

SINGULAIR chewable tablets contain aspartame, a source of phenylalanine.

Phenylketonurics: SINGULAIR 4-mg and 5-mg chewable tablets contain 0.674 and 0.842 mg phenylalanine, respectively.

Inactive ingredients:

- **4-mg oral granules:** mannitol, hydroxypropyl cellulose, and magnesium stearate.
- **4-mg and 5-mg chewable tablets:** mannitol, microcrystalline cellulose, hydroxypropyl cellulose, red ferric oxide, croscarmellose sodium, cherry flavor, aspartame, and magnesium stearate.
- **10-mg tablet:** microcrystalline cellulose, lactose monohydrate, croscarmellose sodium, hydroxypropyl cellulose, magnesium stearate, hydroxypropyl methylcellulose, titanium dioxide, red ferric oxide, yellow ferric oxide, and carnauba wax.

What is asthma?

Asthma is a continuing (chronic) inflammation of the bronchial passageways which are the tubes that carry air from outside the body to the lungs.

Symptoms of asthma include:

- coughing
- wheezing
- chest tightness
- shortness of breath

What is seasonal allergic rhinitis?

- Seasonal allergic rhinitis, also known as hay fever, is an allergic response caused by pollens from trees, grasses and weeds.
- Symptoms of seasonal allergic rhinitis may include:
 - stuffy, runny, and/or itchy nose
 - sneezing

Rx only

Issued April 2004

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We found our best watch in a history book

In 1922, a small watchmaker in Switzerland designed the first automatic watch to display the day, month and date. Only 7 of these magnificent timepieces were ever made and this watch was almost lost to history. Today, they are so rare that our watch historians are willing to bid \$300,000 for an original in mint condition.

These watches were among the most stylish of the roaring 20's. The Stauer watch design that you see here has the antique color, the vintage style and the innovative functions of the original that we have seen in a Swiss museum. Even the Breguet™ style hands are designed from the original. The owner of this legendary multi-functional watch is sure to look distinguished and set apart from the crowd. This Stauer watch is a limited edition, allowing you to

wear a watch far more exclusive than many luxury brands.

The watch has a 24-jewel mechanical movement, the kind desired by fine antique watch collectors. We have updated this movement with an automatic rotor thus the watch never needs to be manually wound. The watch comes in a beautiful crocodile embossed case with a free second band.

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ON THE ROAD, IN THE FIELD

EMPTY QUARTER

Look Out Below

A photographer's flying machine turns heads

The Arabian Peninsula's Empty Quarter doesn't appear very empty from beneath the canopy of photographer **George Steinmetz's** ultralight. Floating above mud-brick houses, George recorded the dense street grid of Shibam, an ancient desert trading town.

George's ultralight, which is a paraglider with a propeller,

proved especially useful in the desert, affording spectacular views of the landscape. But in Yemen, where strangers often are greeted with gunfire, wouldn't an unidentified flying contraption make an inviting target? "No one shot at me," says George. "Some women in the Hadramawt threw stones. Luckily none of them were good shots."

GEORGE STEINMETZ

GOVERNMENT

C O V E R I N G T H E N E W W O R L D





CHRISTOPH GERIGK

STEUBEN WRECK

Depths of Experience

Writer **Marcin Jamkowski** (above) couldn't wait to strap on 200 pounds of gas-filled tanks and drop into the inky waters of the Baltic Sea. After all, only a few divers had ever seen the wreck of *Steuben*, a German World War II ship 235 feet below the surface.

But Marcin, deputy chief editor of NGM's Polish edition, and the rest of the team approached the dive with solemnity as well. More than 4,500 wounded soldiers, refugees, medical staff, and crew died when Soviet torpedoes sank the *Steuben* on February 10, 1945; some of their skeletons still lie amid the wreckage of the ship.

The site particularly haunted

photographer **Christoph Gerigk**. His father's family came close to boarding the doomed *Wilhelm Gustloff*, which was destroyed by torpedoes from the same submarine that 11 days later would sink the *Steuben* just a few miles away.

Christoph's father (below, second from right) and his family were scheduled to depart aboard the *Gustloff* on January 30. But before they left for the boat, the children's shoes were ruined while drying on a stove. Christoph's grandmother, third from left, decided they needed new shoes, so the family postponed their departure. That night the *Gustloff* went down, killing as many as 9,000.

The *Steuben*, draped in 60 years' worth of fishing nets, remains a ship of peril. At one point the nets caught the dive team's ROV (remotely operated vehicle). Freeing it was "incredibly risky," Marcin says, noting that divers on a similar rescue had died. After hours of planning, Marcin and the chief diver went down, and in five tense minutes cut the vehicle loose.



FRANZ GERIGK

WORLDWIDE

SALTON SEA

California is in the blood of photographer **Gerd Ludwig** and writer **Joel Bourne**, but they still weren't ready for what awaited them at the Salton Sea in the state's arid southeastern corner. Gerd, for one, suffered climate shock. "I'd been shooting so many assignments in Russia, experiencing extreme cold, that the editors thought I deserved to work in a warm climate," says the Hollywood resident. His reward: 120-degree days. "It got so hot, I burned my fingers picking up my camera." Joel could anticipate the Salton Sea's inland heat, having previously visited the area to write about its once abundant birdlife. But he was dismayed to note the decline in bird populations. Nevertheless, he says, the place won him over. "I'm drawn to funky areas where people don't fit the mold."

GREAT GRAY OWLS

Owl-watching in Montana, writer **Lynne Warren** came close enough to a great gray to see that the predator's imposing form is essentially all feathers. "It looked like a kid galumphing around the house in his dad's overcoat," she says. Lynne also spotted the northern pygmy owl after a researcher instructed her to "look for a pinecone with a tail." The owl scientists themselves were a hoot, showing off their repertoire of calls. "They love speaking owl," says Lynne.

TALES FROM THE FIELD Find more stories from our authors and photographers, including their best, worst, and quirkiest experiences, at nationalgeographic.com/magazine/0502.

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CESAR[®] Brand Little Dog, Big Screen Sweepstakes,
P.O. Box 5370, Ellenton, FL 34222-5003

**Or enter at
cesar.com**

NO PURCHASE NECESSARY. A PURCHASE WILL NOT IMPROVE YOUR CHANCES OF WINNING. Open to individual legal residents of U.S. (excluding territories and possessions), who have attained the age of majority in their state of residence as of 1/3/05.

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For each CESAR® PuchiBag™ request received in accordance with the instructions above, you will automatically be entered once into the CESAR® Brand Little Dog, Big Screen Sweepstakes (See Official Rules below). Open to individual legal residents of U.S. (excluding territories and possessions), who have attained the age of majority in their state of residence as of 1/3/05. Allow 8-10 weeks for delivery of the PuchiBag™. Limit one per household/address; requests from groups, clubs or organizations will not be honored. New York residents pay applicable sales tax. Void where otherwise taxed, prohibited or restricted. No incomplete, illegible, damaged, copied, mechanically reproduced, altered or forged cash register receipts accepted. No returns will be accepted by PuchiBag, Inc. Masterfoods USA, a division of Mars, Inc., is not responsible for lost, late, incomplete, postage-due, damaged, misaddressed or misdirected mail. All requests must be received by 4/29/05. ©/TM Trademarks © Mars, Incorporated 2005 PuchiBag is a trademark of PuchiBag, Inc.



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CESAR® BRAND LITTLE DOG, BIG SCREEN SWEEPSTAKES. 1. HOW TO ENTER: NO PURCHASE NECESSARY. A PURCHASE WILL NOT IMPROVE YOUR CHANCES OF WINNING. There are 4 ways to enter: 1) complete an Official Entry Form found in February 2005 issues of select consumer magazines; 2) complete an Official Entry Form available at www.cesar.com and click on "Submit"; 3) you are automatically entered once into the Sweepstakes when you order a CESAR® Brand Small Polka Dot Bowling PuchiBag™ or a Large Red Tote PuchiBag™; or 4) print your name, birth date, address, city, state, zip code, daytime phone number and e-mail address (optional) on a 3-1/2" x 5" card or plain piece of paper. If entering by mail (methods 1 or 4), mail your completed entry in an envelope to: CESAR Brand Little Dog, Big Screen Sweepstakes, P.O. Box 5370, Elenton, FL 34222-5003. Sweepstakes begins at 12:00:01 a.m. EST on 1/3/05 and ends on 4/29/05. **ALL ONLINE ENTRIES MUST BE RECEIVED BY 11:59:59 PM EST ON 4/29/05. ALL MAIL-IN ENTRIES AND PUCHIBAG™ ORDERS MUST BE POSTMARKED BY 4/29/05 AND RECEIVED BY 5/6/05.** No incomplete, illegible, forged or altered entries or mechanically reproduced mail-in entries will be accepted. Limit one (1) online entry per e-mail address per day. Each online entry will be deemed to have been submitted by the record holder of the e-mail account from which the entry originated. Enter by mail as often as you wish, but each mail-in entry must be mailed separately. All entries become the sole property of Sponsor and will not be acknowledged or returned. **2. SELECTION OF WINNER:** Winner will be determined from all eligible entries received in a random drawing to be conducted on or about 5/13/05 by Ventura Associates, Inc., an independent judging organization whose decisions are final on all matters relating to this Sweepstakes. Odds of winning depend on the number of eligible entries received. Winner will be notified by mail. In order to receive prize, winner will be required to sign an Affidavit of Eligibility and Liability/Publisher Release. Trip participant must sign Travel Release. Prize may be awarded to alternate winner if Affidavit/Release is not returned within 14 days after mailing to winner, or if prize notification letter or prize is returned as undeliverable. **3. PRIZE/APPROXIMATE RETAIL VALUE:** (1) **Grand Prize:** A 5-day/4-night trip for two (2) people and winner's dog to the 2006 SUNDANCE FILM FESTIVAL scheduled to be held Jan. 19 - 27, 2006 in Park City, UT ("Prize Trip"). Prize Trip includes 4-nights hotel accommodations (1 room/double occupancy) for two (2) people and the winner's dog, subject to restrictions imposed by the hotel (Sponsor to select hotel); round-trip coach airfare for two (2) people and one (1) dog from major airport nearest winner's primary residence (as determined by Sponsor) to Salt Lake City, UT. (In the event that winner lives within 250 miles of Salt Lake City, UT, Sponsor will provide ground transportation instead of airfare.); two (2) tickets to the SUNDANCE FILM FESTIVAL'S Opening Night Screening and Opening Night Gala (alcoholic beverages and food not included); two (2) tickets to a premiere screening (screening to be selected by Sponsor); two (2) tickets to a regular screening (screening to be selected by Sponsor); two (2) single-day lift tickets at nearby ski resort (Sponsor to select ski resort); and a check in the amount of \$2,000 to be used for car rental, spa treatments or any other purpose chosen by winner. Winner, guest and dog must travel together on same itinerary and must be available to travel on dates specified by Sponsor. All elements of Prize Trip are subject to availability, blackout dates and travel restrictions. Winner must provide airline-approved carrier for the dog and current medical/shot records as required by airline. Carrier must fit under the winner's seat on plane, or dog and carrier must be stowed in the cargo hold of the plane, weather permitting. Sponsor not responsible for any injury to dog, transport of dog subject to all related airline restrictions. Sponsor not responsible for postponement or cancellation of the SUNDANCE FILM FESTIVAL, screenings or parties. In the event the SUNDANCE FILM FESTIVAL, screenings or parties are canceled, prize will be awarded without that portion of Prize Trip. All costs not expressly assumed by Sponsor in these rules including but not limited to ground transportation and food will be the responsibility of prizewinner. Additional restrictions may apply. (Approximate Retail Value: \$6,536) Prize will be awarded (assuming sufficient number of entries are received). Sponsor reserves right to substitute prize of comparable value. No other substitution or transfer of prize permitted. Sponsor responsible only for prize delivery; not responsible for prize utility, quality or otherwise. **4. ELIGIBILITY:** Sweepstakes open to individual legal residents of U.S. (excluding territories and possessions), who have attained the age of majority in their state of residence as of 1/3/05 (except employees, their immediate families and members of the same household of Sponsor, Ventura Associates, Inc., SUNDANCE INSTITUTE, PuchiBag, Inc. and their respective affiliates, agents, judges and advertising, production and promotion agencies). Trip participant must have attained the age of majority in his/her state of residence as of the date of his/her Travel Release. **5. MISCELLANEOUS:** Winner agrees to use of name, address, likeness, and/or prize information for promotional purposes in any medium without further compensation to the extent permitted by law. This offer is void outside the United States and where prohibited or restricted by law and subject to all applicable federal, state, and local laws and regulations. All taxes and fees are the sole responsibility of prizewinner. This Sweepstakes will be governed by the internal laws of the State of Delaware. Any and all legal actions or claims arising in connection with this Sweepstakes must be brought in a court of competent jurisdiction within the United States of America. By participating in this Sweepstakes, each entrant accepts the conditions stated in these Official Rules, agrees to be bound by the decisions of the judges and warrants that s/he is eligible to participate in this Sweepstakes. By accepting prize, winner agrees to release Sponsor, PuchiBag, Inc. and their respective directors, employees, officers and agents, including without limitation, their advertising and promotion agencies, from any and all liability, loss or damages arising from or in connection with participation in this Sweepstakes and the awarding, receipt, and/or use or misuse of any prize or participation in any prize-related activities. Sponsor and judges not responsible for late, lost, stolen, damaged, garbled, incomplete, misaddressed, postage-due, or misdirected entries or communications; for errors, omissions, interruptions, deletions, defects, or delays in operations or transmission of information, in each case whether arising by way of technical or other failures or malfunctions of computer hardware, software, communications devices, or transmission lines or data corruption, theft, destruction, unauthorized access to or alteration of entry materials, loss or otherwise. Sponsor disclaims any liability for damage to any computer system resulting from participation in, or accessing or downloading information in connection with, this Sweepstakes, and reserves the right, at its sole discretion, to modify, cancel, terminate or suspend this Sweepstakes should any virus, bug, technical failures, unauthorized human intervention or other causes beyond Sponsor's control corrupt or affect the administration, security, fairness or proper conduct of the Sweepstakes. In the event of such cancellation, termination or suspension, a notice will be posted and a random drawing will be held from among all eligible entries received prior to such time. Sponsor reserves the right, at its sole discretion, to disqualify any entrant if his or her fraud or misconduct affects the integrity of the Sweepstakes. **6. CAUTION: ANY ATTEMPT BY AN ENTRANT TO DELIBERATELY DAMAGE ANY WEBSITE OR UNDERMINE THE LEGITIMATE OPERATION OF THIS SWEEPSTAKES IS A VIOLATION OF CRIMINAL AND CIVIL LAWS. SHOULD SUCH AN ATTEMPT BE MADE, SPONSOR RESERVES THE RIGHT TO SEEK DAMAGES FROM ANY SUCH ENTRANT TO THE FULLEST EXTENT PERMITTED BY LAW.** **7. WINNER'S NAME:** For the name of prizewinner, send a self-addressed, stamped envelope before 4/29/05 to: CESAR Brand Little Dog, Big Screen Sweepstakes Winner, P.O. Box 5573, Elenton, FL 34222-5005. Winner's name will be sent after selection of winner. DO NOT SEND ANY OTHER CORRESPONDENCE TO THIS BOX NUMBER. **8. SPONSOR:** Masterfoods USA, a division of Mars, Incorporated, 3250 E. 44th Street, Vernon, CA 90058-0853. Neither SUNDANCE INSTITUTE nor PuchiBag, Inc. is a Sponsor of the Sweepstakes. 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Who Knew?

BIOLOGY

Ladies' Lunch

It's strictly the females who line up at this buffet

Robert Vrijenhoek went looking for some clams and instead discovered something that belongs in the Hall of Very Weird Animals.

He was on a research ship floating 20 miles off the coast of California, above Monterey Canyon. It was February 6, 2002, and 9,000 feet below, a robotic submersible surveyed the sea-floor, desolate but for a little algae and the occasional clump of grass or rogue plastic bag. Suddenly the camera glimpsed the carcass of a whale colonized by worms with red, feathery protrusions. The sub nabbed some bones for a closer look.

The worms looked a bit like the tube worms that live around deep-sea vents, only they were much smaller. Vrijenhoek named the new genus *Osedax*, meaning "bone devourer." They'd been

feeding on the ribs of a 30-foot-long gray whale that had sunk to the depths of the canyon (such a carcass is called a whale fall). "If there's something to eat, somebody will find a way to eat it," Vrijenhoek says.

All of these *Osedax* scavengers, however, turned out to be females. Where were the males?

The mystery took two years to solve. An Australian researcher named Greg Rouse identified

microscopic "sperm packages" inside the female worms' tubes. Further inquiry revealed that the packages *were* the males, little sperm factories living off blobs of yolk. "They just sit there giving sperm to the female until their yolk runs out," Rouse says.

Sexual dimorphism—where males and females exist in different forms—is common in the natural world. In humans, males are just slightly bigger than females. In some anglerfish species, on the other hand, the male is comically petite, attaching himself to the female and withering away, leaving only his testes.

Vrijenhoek says he knows of no sexual dimorphism as extreme as in *Osedax*. The males live their whole itty-bitty lives inside the tubes of the females, servicing their reproductive needs in an otherwise thankless existence.

Obviously this is, for some of us, a cautionary tale. Ladies, don't get any ideas. —Joel Achenbach

WASHINGTON POST STAFF WRITER

Arrested Development

"Male" means having a Y chromosome, right? Not always. Environment, not genetics, determines sex in some species. Researchers postulate that *Osedax* begin as unsexed floating larvae. If they land away from other females feeding on a whale carcass, they become female. If they land on a female worm, their development is arrested, and they live ever after as male sperm donors inside the female. —Heidi Schultz

WEBSITE EXCLUSIVE For more on *Osedax*, and for links to Joel Achenbach's work, go to Resources at nationalgeographic.com/magazine/0502.

A full-page photograph of a desert landscape. The foreground and middle ground are filled with rolling sand dunes, some with distinct ripples. The dunes are bathed in warm, golden light, suggesting late afternoon or early morning. The sky is a clear, deep blue. The overall mood is serene and majestic.

EMIP

The borders of four nations blur beneath the shifting sands of the Rub al Khali, or Empty Quarter. Defined by geologic wonders and the tribes who roam its edges, this vast desert wilderness has beguiled travelers for centuries.

QUA

EXPLORING

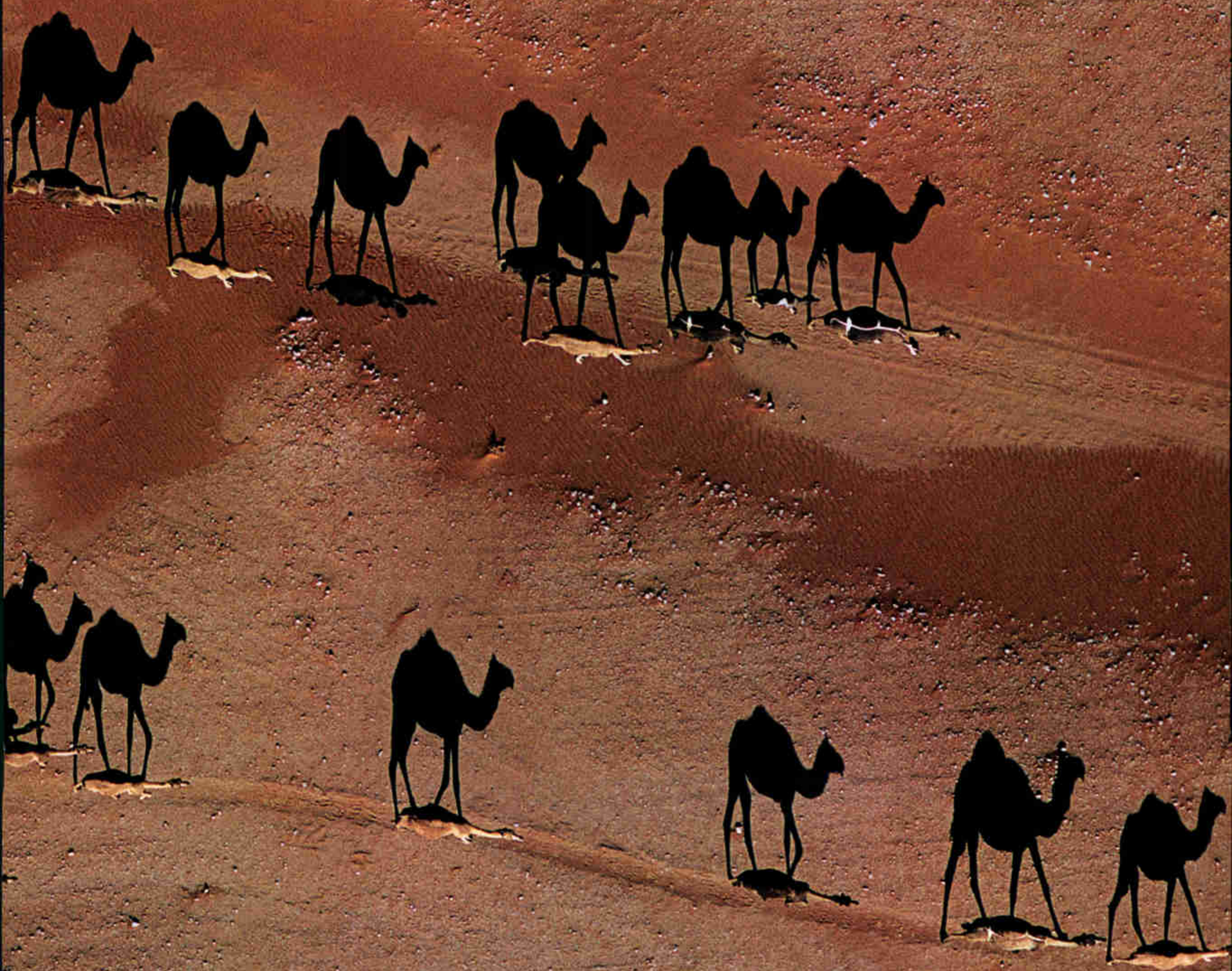
A full-page photograph of a desert landscape. The foreground is dominated by large, undulating sand dunes with sharp ridges and deep shadows, creating a rhythmic pattern of light and dark. The dunes extend into the distance, where they meet a flat, sandy plain. In the far background, a range of low, hazy mountains is visible against a clear, pale blue sky. The lighting suggests late afternoon or early morning, with long shadows and a warm, golden hue to the sand.

TY

RTER


ARABIA'S LEGENDARY SEA OF SAND





Late-day sun silhouettes camels in search of grass in Oman. Most of the desert tribes, who are Bedouin, or Bedu, no longer live as nomads yet still rely on camels for milk, meat, wool, leather, and transport. Able to lug heavy loads for days without water, camels—once the only reliable form of desert travel—are giving way to pickup trucks.



An aerial photograph of Shibam, Yemen, showing a dense cluster of mud-brick buildings. The buildings are multi-storied and have flat roofs, creating a complex, geometric pattern. The lighting is warm, suggesting late afternoon or early morning, with long shadows and golden highlights. The buildings are tightly packed together, with narrow alleys visible between them. The overall scene is a testament to traditional architecture in a desert environment.

Distinctive mud-brick buildings encircle a mosque in Shibam, Yemen, which once thrived as a stop on Arabia's spice route. Home to some 5,000 people, Shibam now attracts tourists, who call it the "Manhattan of the Desert."



A Yemeni woman displays the handiwork of a local artist who uses dye made from henna plants and a paint called khidab to create these signature designs, often worn during celebrations. Sometimes planted to curb erosion, henna contains tannins that act as a sunscreen and keep skin from drying in desert heat.

BY DONOVAN WEBSTER
PHOTOGRAPHS BY GEORGE STEINMETZ

A edaa bin Hassan's "hello" comes from his Kalashnikov. And as my four-wheel drive bumps up a dry riverbed toward his white canvas tent in Arabia's Empty Quarter, bin Hassan gladly extends some Bedouin hospitality my way. CRACK! A chunky 5.45-millimeter bullet splits the blue sky as it whizzes past my car window. The rifle's report echoes chaotically through the dry canyon. I take a gulp of air.

We are in Yemen, after all: a poor nation at the south end of Arabia, where gun culture is so ingrained that it ranks as one of the most heavily armed societies in the world. Still, despite this

wealth of weapons, there remain proper ways of behaving, especially among Bedouin herdsmen. So, as tradition demands, we continue our approach toward bin Hassan's tent, letting him complete his welcome.

CRACK! Another bullet shatters the afternoon sky. It rips the air above my head, again trailed by the roar of the rifle.

Aedaa bin Hassan has now finished his greeting. Three hundred yards from his tent, beneath a blistering sun, we halt our line of vehicles.

In the vehicle ahead, Awad—a Yemeni Army officer assigned to guide me—opens a hand in my direction, signaling me to wait. Among the Bedouin, whether you're approaching their camps by camel or car, a representative must split from the arriving group and declare intentions following a host's greeting. So Awad steers his four-wheel drive away from our convoy, and, 200 yards from the tent, he stops and steps out.

He shouts "*Salaam Alaikum!*—Peace be with you!"—several times toward the tent, while flopping his right hand in the air as proof he is unarmed. Reaching down, he tosses sand high on

the wind, also with his right hand: a time-honored signal of peace in the region.

Behind a gray stone outcrop near the tent, bin Hassan, a bony man with a long gray beard, rises from his hiding place. He's wearing a traditional white Arab gown—known in Yemen as a *thawb*—and a head wrap printed in red and white checks, here called a *mashadah*. He lifts his assault rifle above his head, a signal that all is well. Then, as Awad begins walking toward bin Hassan's tent, he waves for me to follow.

By the time I arrive at the tent, a group has assembled on the oriental rugs inside, seated with a pot of tea and a silver tray full of empty cups between them. As I enter, bin Hassan introduces himself and his one-eyed, gray-bearded brother, Hamid. Both are in their 70s.

"You, as a Westerner, may not understand a Bedouin greeting," bin Hassan says. "But this is the way we've always done it. If the visitor approaches as you did, he is welcomed, even if he is from an enemy tribe. Once welcomed, he's entitled to all we have—food, tea, rest, care. That is our way. Even for our enemies, we give everything if they show peacefulness."

What happens, I ask, if someone approaches in an unfriendly way?

At that moment, four bearded and robed young men file into the tent. Each carries an assault rifle seemingly held together by duct tape. They set their weapons in a pile next to bin Hassan's Kalashnikov.

"We saw you coming from a long way away," he says, handing me a steaming cup of sweet tea. "My sons and nephews"—bin Hassan nods to the newcomers—"surrounded you as you approached. If you had showed hostility, our shots would have come nearer to you with every step. You would soon see the wisdom of retreat."

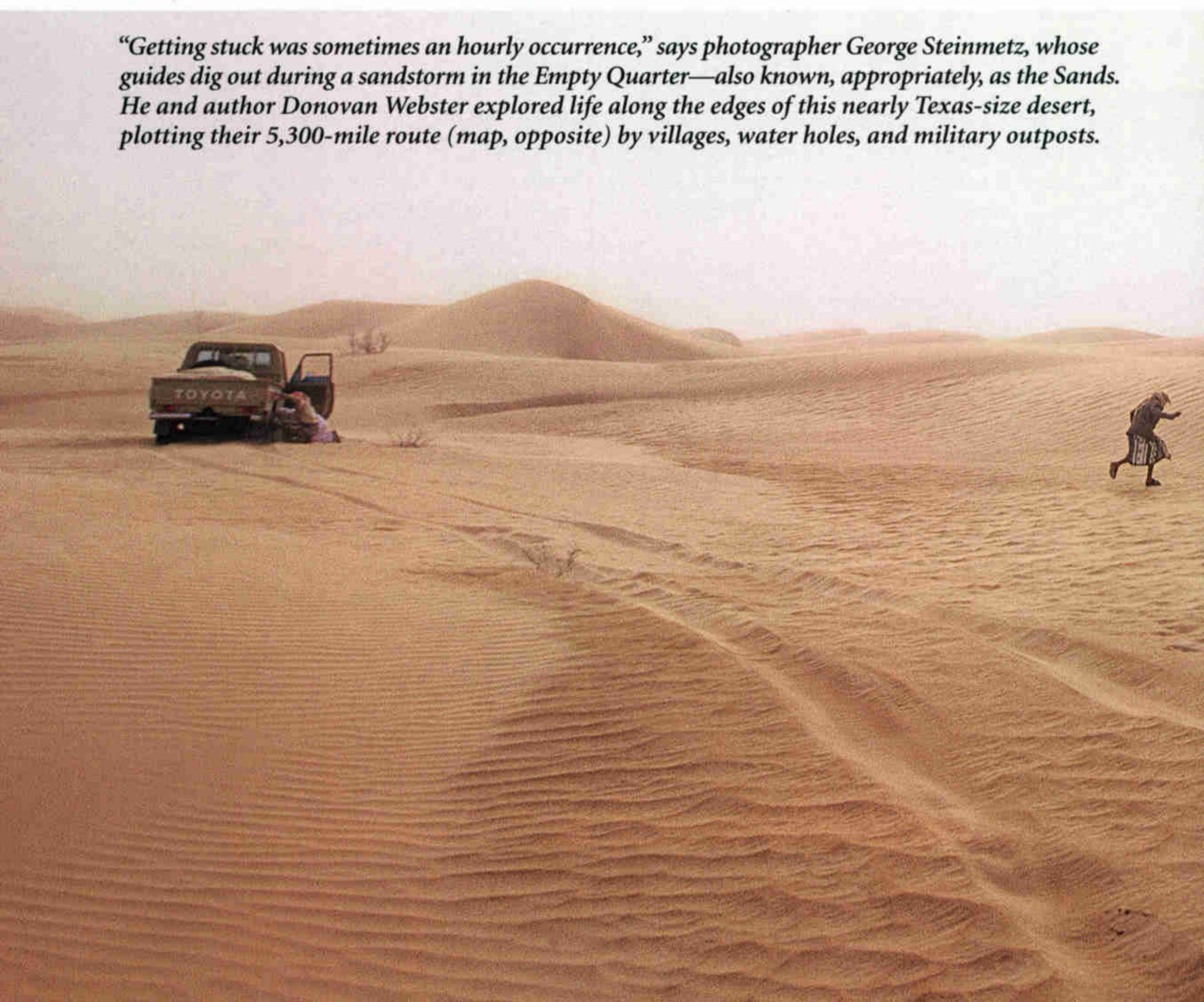
Welcome to the Rub al Khali, or Empty Quarter—a world of harsh extremes that may rank as both the least, and most, hospitable place on Earth. I arrived in Arabia last January with photographer George Steinmetz and a plan to explore the

Empty Quarter. Before our eight-week expedition is over, we will cover more than 5,300 miles on a journey through Saudi Arabia, Oman, and Yemen. We will also be shot at—in the most genial of ways—not once but several times, invariably followed by an invitation to drink tea.

For thousands of years this territory has resisted settlement as one of the Earth's hottest, driest, and most unyielding environments. Yet it's also home to a culture on the edge, a proud Bedouin society working to adapt its mix of Islam, ancient tribal custom, and new-found oil riches to a demanding and fast-paced modern world.

Taking up a fifth of the Arabian Peninsula, the Rub al Khali (literally, "quarter of emptiness"), or the Sands for short, is the world's largest sand sea. At more than 225,000 square miles, it takes in substantial portions of Saudi Arabia, as well as parts of Oman, Yemen, and the United Arab Emirates to create an arid

"Getting stuck was sometimes an hourly occurrence," says photographer George Steinmetz, whose guides dig out during a sandstorm in the Empty Quarter—also known, appropriately, as the Sands. He and author Donovan Webster explored life along the edges of this nearly Texas-size desert, plotting their 5,300-mile route (map, opposite) by villages, water holes, and military outposts.





LANDSAT MOSAIC BY ROBERT STACEY, WORLDSAT INTERNATIONAL INC.; NATIONAL GEOGRAPHIC MAPS



In a rare glimpse inside a Bedu women's tent, recently widowed Thenwa Oshere Sanaw (fifth from left) poses with some of her daughters. This family, like many of the Bedu in Yemen, has kept its

traditional lifestyle rather than move to a markaz, a government-built administrative center. At an isolated markaz near Wadi Hazar (below), half-finished houses have stood empty for a decade.



"WHEN WE LIVED OUT IN THE SANDS IN TENTS,

wilderness larger than France. It holds roughly half as much sand as the Sahara, which is 15 times the Empty Quarter's size but composed mostly of graveled plains and rocky outcrops.

Because of these sandy expanses, not to mention its profound heat, the Sands have long been judged too unforgiving for all but the most resourceful humans, considered more a wasteland to cross than a landscape to settle in. Still, along its edges—and venturing across it from time to time—the dozen tribes of leathery and enterprising Bedouin, also known (especially in Arabia) as Bedu, have survived here since before recorded time.

The Bedu inhabited the desert with intelligence and the accumulated skill of a hundred generations. Masters of their environment, the tribes of the Rub al Khali—including the Saar,

the Rashid, the Manahil, the Mahrah, the Awamir, the Bani Yas, and the Dawasir—operated in a complex, honor-based world of conflicts and alliances, raids and counterraid, where no detail (a camel's hoofprint in the sand, a day-old fire) went unnoted, and wells were defended to the death.

The tribes ignored national borders, adhering to their own territorial boundaries defined by kinship and tradition. And until recently, they remained uninterested in the petrochemical riches beneath their feet, which now threaten to sweep away what's left of their traditional lives.

So one of my goals on the expedition is to see what remains of Bedu culture during this time of turbulent change. Another is simply to experience the Rub al Khali's harsh and gorgeous landscape on its own terms.



WE OWNED ONLY WHAT WE COULD CARRY."

Thousands of years of relentless winds out of Iran to the north have scoured this desert, creating endless fields of dunes and sand mountains rising to more than 800 feet. Where these dunes exist in orderly lines, the Bedu named them *uruqin*, or veins, and used the valleys between them as roadways for travel.

Many valleys contain a *sebkha*, a depositional plain of silt and salt that is sometimes baked to a crust by the desert sun. With the slightest rainfall or overnight condensation, *sebkhas* become mires. When dry, their brittle surfaces often give way beneath the weight of a shoe or car tire, with edges so sharp they're capable of slashing through either one.

As we set off for the Empty Quarter's interior, my initial aim is to find a band of Bedu and live with them for an extended period. That may

sound simple, but heading east from Saudi Arabia's capital of Riyadh in midwinter, all we find is empty sand.

We drive for two days, pushing between lines of brick red sand dunes that rise from the desert plains south of the city. By the morning of the second day—having endured a furious sandstorm overnight—we've ventured into the outer reaches of Rub al Khali's mature dunes, with sand ridges towering high above the valleys. We also begin seeing single-humped camels (first in small clumps, then in strings of 25 or 30) wandering the *sebkha* flats.

Finally, just before noon we spot a man, silhouetted against a red dune, riding a camel toward us from the south. We try to hail him, but he refuses to slow down. As we drive closer, he shouts in broken

(Continued on page 18)

GROUND TRUTHS

Before entering the desert, Steinmetz and Webster studied a satellite image of Saudi Arabia (right). Below are features they chose to explore.



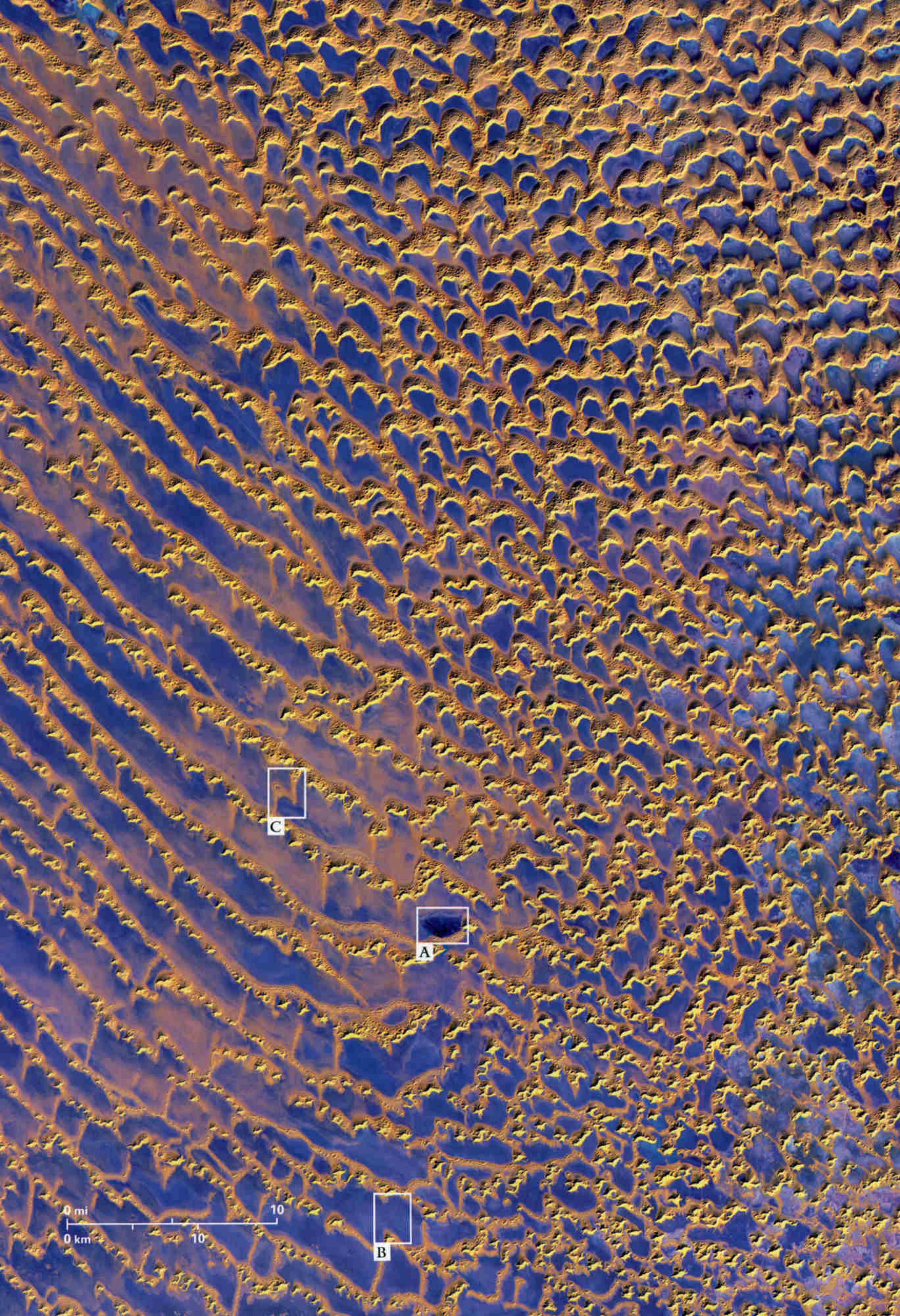
A A water hole in the desert is a welcome sight, but not all such pools are potable. “This one smelled like sulfur,” says Steinmetz, who thinks it might be man-made, the vestige of a defunct oil site. Generally water holes are fed by subsurface water traveling from surrounding mountains to the lowest spots in the desert. Along the way the water dissolves minerals that give it a brackish taste.



B Between the dunes, a broad expanse of flat desert floor is known as a sebkha—a salt-encrusted plain (shown in blue at right). In some places the crust offers a firm driving surface, but elsewhere it collapses into sinking sand. “The trick to navigating a sebkha is to gradually steer your way out of soft stuff without losing speed,” says author Donovan Webster. “If you stop, you’re stuck.”



C Fingerling chains form sand bridges that connect large parallel dune formations. The Empty Quarter produces myriad dune shapes, each formed by a different set of conditions. The dune patterns (right, shown in yellow) indicate winds blowing predominantly from the northwest, upper left, but the tightly swirled clusters at lower right reflect an area that also receives winds from the south.




C

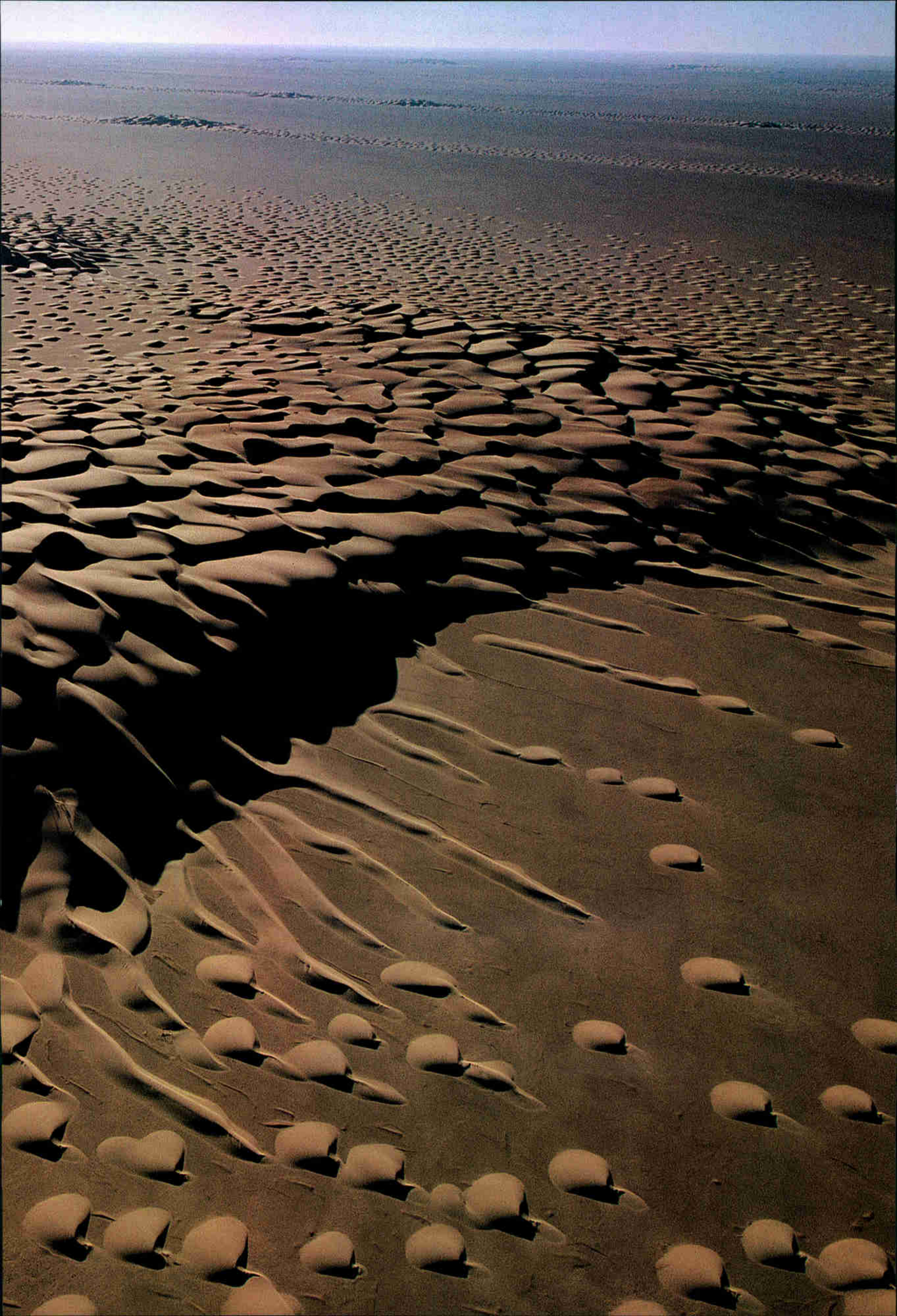
A

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0 mi 10
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Strange creatures slithering up from the desert floor are really a network of barchan dunes—sculpted by winds that over time strike the sand from a consistent direction. Like living organisms the dunes grow, move, and reproduce. The large mass in the middle spawned the small round dunes in front, each about 30 feet wide.





TRAVELERS' DESCRIPTIONS OF TRADITIONAL

(Continued from page 13) Arabic, "Stay away! Keep your distance!"

"He's Pakistani," explains Imad Khalid, one of our expedition managers. "Today the Bedu still conduct trade and business, but from the towns. They hire others—mostly Pakistanis and Bangladeshis—to do their herding." Because oil money is finally trickling down to the Bedu, Imad tells me, the government has created population centers in the desert. These are called *markaz*, often with free housing and schools and medical care. In the Rub al Khali many of the Bedu have moved to the *markaz*. "To meet Bedu these days," he laughs, "you may have to go to the towns."

It hasn't always been this way. By the mid-19th century a flood of British adventurers and military types had begun pressing into the Arabian

Peninsula—a list that includes Charles Doughty, Anne Blunt, William Palgrave, Sir Richard Burton, Gertrude Bell, and T. E. Lawrence, better known as Lawrence of Arabia. The travelers' exotic descriptions of traditional Bedu life, unchanged for hundreds, perhaps thousands, of years, captivated the outside world.

Still, these explorers, while depicting the tribes of northern Arabia, stopped short of the peninsula's desolate and desiccated Empty Quarter, whose enormous distances and ruinous environment placed it beyond their reach.

It wasn't until the British explorer Bertram Thomas crossed the Sands by camel in 1930-31 that the Rub al Khali finally captured Western attention. In 1932 Thomas published his popular book, *Arabia Felix (Happy Arabia)*, which described the desert's animals and geology



Outside the town of Marib, stone pillars and other remnants of the Sanctuary of Bilqis (left) offer clues to a powerful kingdom that may have been ruled by the legendary Queen of Sheba, mentioned in both the

Koran and the Bible. Nearby, Yemeni scholar Abdu Ghaleb examines an alabaster funerary marker (below) that ancient masons appear to have taken from a graveyard and recycled as a building block in a wall.



BEDU LIFE CAPTIVATED THE OUTSIDE WORLD.

as well as its human inhabitants. He wrote of the Bedu's constant search for water and food, and their careful planning for every foray into the Sands, which meant trekking from water hole to water hole. He documented their medical treatments using hot pokers to sear away illness, detailed their weapons-based social graces, and described the complex web of intertribal relations that governs life on the margins of survival.

Between 1946 and 1948 the Oxford-trained explorer Wilfred Thesiger managed to cross the Rub al Khali not once but twice, back-to-back, accompanied by local guides. During his year-long journeys, he delved even deeper into the culture of the desert than his predecessors had. In his book, *Arabian Sands*, Thesiger painted a memorably romantic picture of the Bedu, whom

he characterized as “illiterate herdsmen who possessed, in so much greater measure than I, generosity and courage, endurance, patience, and light-hearted gallantry.”

Thesiger predicted an uncertain future for the people he so admired. Oil had been discovered on the Arabian Peninsula in the 1930s, and the tsunami of wealth washing toward it signaled to him that the traditional Bedu life of fiercely solitary independence was doomed.

History proved him right. This is driven home on our expedition's second afternoon, when—after seeing only a few Pakistani herdsmen in the desert—we round the end of a dune and come face-to-face with what appears to be a resort hotel, complete with private airport.

“Ah,” says Imad Khalid. “We have arrived at Shaybah.”

In the 1930s, as the Empty Quarter was first being crossed and documented by outsiders, oil prospectors from California and Texas began searching for petroleum in eastern Arabia to satisfy the industrial world's growing thirst for oil. Within five years, they found deposits that were staggering.

By the late 1930s, as the first oil was being extracted at the Persian Gulf town of Dhahran, the Saudi government entered into an agreement with the American prospectors, creating the Arabian-American Oil Company (Aramco) to market these reserves to the world. Today, although Saudi Arabia bought out its Yankee partners decades ago, the company hasn't stopped producing oil in massive amounts, or drilling for new oil in places like Shaybah.

Discovered in 1968, this oil reserve is said to be named for a *shaybah*—an aged and bearded

Bedu—who lived in the area. Under these sands lies a reservoir spanning more than 300 square miles, which holds some 14 billion barrels of Arab extra-light, one of the world's most desirable grades of crude oil.

In the 1990s, when Saudi Aramco decided to develop the site, this facility—including a cushy 750-bed residential complex, a network of more than a hundred wells, and three enormous oil-gas separating plants—rose to completion in a year and a half. Its 14,000 workers were housed in acres upon acres of double-wide trailers in the desert. They laid 395 miles of pipe to carry the oil to the refinery at Abqaiq and poured a 10,000-foot concrete runway to accommodate the cargo jets that frequently come and go.

All of this, from worker services and housing to construction materials, had to be transported

WE WOULD BE SHOT AT SEVERAL TIMES, AN ACT



into this inhospitable desert more than 400 miles from the nearest city or port. The resulting air-conditioned complex, a world in a bubble, feels like an outpost on Mars.

The contrast is even more striking as we pull away, gears grinding under a sun-bleached sky. We push farther south into the Sands, skirting the edge of the Umm as Samim (“mother of poisons”), a desolate sebkha 80 miles wide that defines the topographical low point of Oman. Farther west, we also explore the vast Uruq al Mutaridah (“the continuous vein”), where sand mountains tower above us, often with two descending legs of sand running from their summits to the valley floor, making them appear sphinxlike.

And still, as we drive deeper into the Sands, we find no Bedu. Instead we encounter soldiers, lots

of soldiers. All across these deepest recesses of Saudi Arabia’s Empty Quarter—near the Saudi border with Yemen and Oman—we find only a string of desolate settlements that appear mostly to be military posts with a few camp followers.

The presence of this many Saudi troops, however, along with the plethora of four-wheel-drive pickups outfitted with rocket-propelled grenade launchers and .50-caliber machine guns, leaves me curious. After some asking around, I discover that Saudi Arabia’s 1,300-mile border with Yemen and Oman is a smugglers’ hotbed—especially the areas north of the Yemen border. It’s estimated, for example, that 200 million dollars’ worth of qat—a stimulant plant chewed in Yemen but illegal in Saudi Arabia—is smuggled into Saudi Arabia annually. Far more ominous are the explosives and weapons illegally entering the kingdom.

ALWAYS FOLLOWED BY AN INVITATION TO TEA.



His cheek full of qat—the leafy stimulant chewed by many Yemenis—a merchant in Marib sells an array of weapons, ranging from modern Kalashnikovs to an antique bolt-action Lee-Enfield rifle (center, leaning against the beam). Concerned about banditry, terrorism, and recent insurgencies, Yemen’s government says it’s closing such shops and buying up surplus guns.

One evening we come upon yet another Saudi military post. Located in a broad, sandy valley hemmed by dunes near the border, it consists of a water tank (there is no well), a Bedu-style tent, a fire pit, four pickup trucks mounted with .50-caliber guns, a few steel lockers, a gas-powered electric generator, and a single-wide trailer that stands high above the sand on steel stilts. A half-flayed sheep swings in the dry wind on a meat hook beneath the trailer. A live sheep—its days numbered—strolls the sand.

As with all stops in the desert, our arrival sets weaponry in motion, quickly followed by a series of hospitable gestures that start with introductions, followed by several small cups of coffee and tea, followed by the offer of a meal. Finally, after 15 minutes of polite conversation, I ask a Saudi sergeant about smuggling in the area.

“What happens,” I ask, “when you actually find smugglers?”

“They rarely fight back,” he says. “We have radios. We have more weapons and better vehicles. Coming from Oman or Yemen, they’re not on their home desert. They usually come quietly.”

“Do you see other cars here?” I ask. “In five years, how many nonmilitary vehicles have you seen here that haven’t been smugglers?”

The sergeant—a sturdy man in his 40s,





The town of Al Hajarayn clings to a hillside overlooking a wadi, or dry riverbed. Noted for its nomadic beekeepers and their swarms, this area yields some of the world's most expensive honey, used as an antibiotic and aphrodisiac. Some 20 miles north lies Al Rubat, the ancestral village of the bin Laden clan.

wearing a desert camouflage uniform and a traditional red-and-white kaffiyeh—ponders the question. He looks at his hands as if counting on his fingers.

He shakes his head. “None,” he finally says.

“Not one car in five years hasn’t been a smuggler?”

“No,” he says firmly. “Would you like some more tea?”

After two weeks and 3,000 miles, we finally find our Bedu herdsmen. And, as Imad Khalid thought we might, we find them in a town.

We are in the markaz village of Al Khanjar (“the dagger”), which sits just beyond the Saudi border in western Oman. We’ve arrived in late afternoon, having driven through small herds of camels, sheep, and goats on our way in. The village itself bears little resemblance to a

border outpost in Saudi Arabia. Instead of sandy tracks and grit-blown desert tents, Al Khanjar is fenced and plaster-walled, with paved streets, flat-roofed homes and offices, flowers and landscaping around every building, an impressive new mosque, and tastefully designed streetlights lining every thoroughfare.

At Al Khanjar we are invited into the home of the local imam, Salem bin Suhail, where we’re seated on the floor and fed mutton and rice from platters. The rooms are clean and large, and they contain a big-screen TV, a stereo, and a scattering of computer wires and cables. Except for little touches of Arab culture here and there—such as sitting on the floor to eat—we could be dining in a southern California subdivision.

Over our meal I have been asking our host what trade-offs the Bedu have made by leaving the nomads’ life for the markaz. I ask him about the abandonment of Bedu culture and

“WE STRADDLE TWO WORLDS: THE ANCIENT



traditions, about the creeping claustrophobia of town, and about the inevitable loss of personal freedom. And each time I ask something new of bin Suhail, he smiles and chuckles, obviously at peace with his life at Al Khanjar.

“Eat,” he keeps telling me, gesturing with his hand. “Fill your stomach, my friend. After our sunset prayer I will provide answers for your many questions. Now, though, is the time for eating. Please. It makes me happy to see you enjoy a meal. We will talk of traditions afterward.”

Thirty minutes later, we have finished our meal and washed our hands. Then, following sunset prayer, as promised, I am led to a quiet corner of the walled town for another meeting and some camel’s milk.

It’s night now. Above us, the desert sky is filled with stars as a few dozen local men take seats on a raised and carpeted platform a few feet above the street. There are pillows to rest against. At

the platform’s center is a fireplace loaded with logs; flames leap into the night’s cool darkness. All around the platform’s edges, robed and white-bearded men are settling in.

A huge wooden bowl, filled with foaming camel’s milk, is produced and begins making its way around the group. We each take three long drafts, then pass the bowl to the man on our right. The milk is warm, thick, and slightly bitter.

Bin Suhail smiles. “You see?” he says, rolling his wrists in a presto motion. “This is today’s Bedu life. We still breed and trade camels. We still live on their milk and the meat from our sheep and goats. But this life is better than the old way. Before, there was no medical care, no schools for our children.”

“I couldn’t agree more,” says Sheikh Muhammed bin Saeed, a serious-faced elder who is seated, legs crossed, to my left. “In the old days, when we lived out in the Sands in tents,

AND THE MODERN. AND THIS IS NOT ALL BAD.”



To keep cool while cutting clover for livestock, women in Yemen’s Wadi Hadramawt wear straw hats called nakhls over the black abayas favored in their conservative Muslim culture. Rich soil, deep wells, and extensive irrigation allow such fields to flourish along the desert’s southern periphery, which receives about four inches of rain a year—compared with the Rub al Khali, parts of which go years without rain.

we owned only what we could carry. Now the government spreads oil revenues to the people, bringing us free housing in the markaz, along with schools and medical care. At first we were suspicious. But this is what we have come to know. We like it.”

Around the platform, heads nod in unison. “The children will have more options for their future,” says an 80-year-old shaybah to my left. He adds that traditional skills—such as weaving and camel milking—are preserved by government festivals. And because camels and goats are kept outside the village, a Bedu can always go into the desert to taste the old life. “Many of us do that,” he says. “We now have the best of both worlds.”

Again, heads nod.

“And today medicines work,” says another bearded man from across the floor. “They are far more reliable than traditional treatments. When I was a boy, I had terrible headaches. To cure them, we didn’t have medicines—so they seared my skin.”

The man walks over, lifts his white head-wrap, and shows me a horizontal black mark between his eyebrows. “The searing worked, my headaches went away. But I’d have preferred

aspirin, painkillers, even surgery—anything but searing. As you might imagine, this was painful for a long time.”

His revelation, which recalls the skin searing that Bertram Thomas first observed in 1930, sets off a chain reaction. And for the next 20 minutes, men are lined up to show me the scars from sear-healing on their upper arms or behind their knees. Soon no one is talking about modern medicine anymore. Eyes shining, the men praise the old ways, the Bedu ways, with obvious pride. They say this burning, plus the ingestion or topical application of different desert plants and roots, still cures many things.

One man even parts his robes and shows me a circle of seven symmetrical burns on his lower right abdomen. “For appendicitis,” he says. “When I was young, many children with appendicitis or other serious illnesses died. In the old

days, they seared you, and you either lived or you died.”

So searing really works? I ask.

“Oh yes,” all of the men say.

“Do you have any serious long-term illnesses?” asks bin Suhail, my host. “We have the fire right here! We can heat up an iron poker and show you how well the old ways work right now—tonight!”

Everyone around the platform, including me, begins to laugh.

“For the Bedu in the markaz, all of life is better now,” bin Suhail continues. “The tent has been replaced by a modern house. We have air-conditioning and clean water whenever we want it. Hot and cold water. We have cars, but we can still trade our livestock. Today we straddle two worlds: the ancient and the modern. And this is not all bad.”

THE SANDS HAVE BEEN MORE A WASTELAND



After five weeks and almost 4,600 miles of exploring the Rub al Khali, our expedition finds itself in Yemen: the only country of the Empty Quarter without sizable oil reserves. The oil-financed institutions that exist in neighboring countries—free housing, free public school, and free medical care—are lacking in Yemen. In fact, the only Yemeni markaz we come upon, near Wadi Hazar in Yemen's northeast, stands half finished and deserted as it has for a decade. Its 48 empty houses, with their flat kitchen rooftops and sand-blown courtyard gardens, resemble a New Mexico housing community gone bust. "The Bedu who were to live here had no services," says a soldier guarding the site. "They went back to the desert—or they never came at all."

In place of markaz life in Yemen, what we find, at last, are hundreds of Bedu living in a

more traditional way. Some still cross the Sands regularly, moving their camps weekly or monthly in search of fresh vegetation for livestock. Others are partially settled, camped in tent villages along the Empty Quarter's edges that are watered by a communal tanker truck. A few even have four-wheel-drive vehicles alongside their camels.

At each camp we are welcomed by the herds-men and their families, then given tea, green leaves of qat to chew in the afternoons (imagine a strong cup of coffee without the jitters), and offered meals of mutton and rice. All of them understand that, beyond the desert life of their ancestors, a new, more modern existence could be found in the Yemeni cities of Sanaa or Aden.

One evening I visited a shaybah named Sheikh Salem bin Yahya al Hazri at his solitary desert camp near Yemen's border with Saudi Arabia.

TO CROSS THAN A LANDSCAPE TO SETTLE.

Every ten days a truck delivers a thousand liters of water to the few families still living in the village of Old Marib, once at the heart of a kingdom made rich by the spice trade. Today the town's shattered buildings stand as stark reminders of Yemen's civil war in the 1960s, and residents struggle to survive the effects of drought and a shrinking water table.

After the usual pleasantries, I asked him why he didn't just move to the city?

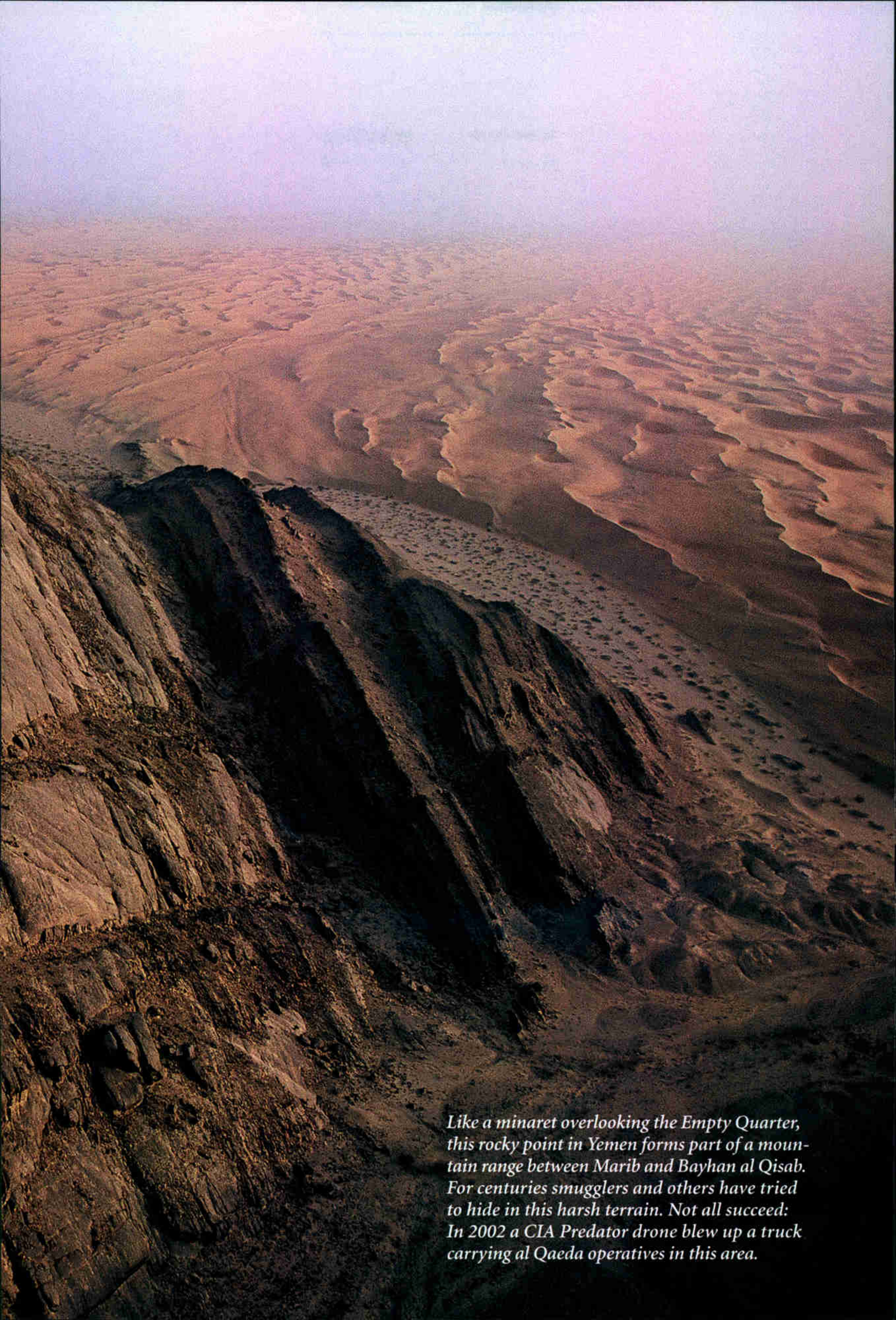
"My priority is the camels, just as it was for my father and his fathers forever into the past," he says, as we sit on a beautiful oriental rug on the sand. The sheikh, a sprightly man in his 60s or 70s ("I don't know how old I am," he says, "but I'm younger than a hundred!"), is sipping tea and grousing about his aching back. A member of the al Hazri clan, he is respected as a gifted caretaker of animals. To his right a stainless steel bowl of camel's milk sits, having made two circuits around the rug since our arrival.

"I am Bedu, it is that simple," Sheikh Salem goes on, gesturing toward the empty desert, a landscape made three-dimensional by the sand dunes in the moonlit distance and, closer, the silhouettes of camels, sheep, and goats. "I have camels and livestock. But it's the camels that are the true center of my life. I'm responsible for their being, and in turn they sustain me. What would a camel do in a town or a city? It's my job to look after them here. This is what the Bedu have always done."

He sips his tea. "Of course, I wish we had the oil money and markaz life they have in Saudi Arabia and Oman," he says. "If only so we could educate our children, so they have







Like a minaret overlooking the Empty Quarter, this rocky point in Yemen forms part of a mountain range between Marib and Bayhan al Qisab. For centuries smugglers and others have tried to hide in this harsh terrain. Not all succeed: In 2002 a CIA Predator drone blew up a truck carrying al Qaeda operatives in this area.

more choices than I had. My life's path with camels was chosen for me at birth."

Above us the stars twinkle; occasionally a meteor slashes open the darkness. Sitting here with Sheikh Salem, I can see why he's made the choice he has. He seems supremely happy, content with his hard life in this hard place, where travails and blessings drift down upon him in equal measure.

Just then, photographer George Steinmetz leans back against the rolled lump of a spare oriental rug, displacing a mouse, which—desperately looking for cover—streaks up the leg of his blue jeans, sending him jumping as it climbs up his left trouser leg and down his right. When the mouse hits the rug near Steinmetz's right foot, it glances around in stunned horror, and we all begin to laugh.

"You see," says Sheikh Salem. "Everyone says the Rub al Khali is empty and desolate. But this is God's place, and life is everywhere. And this world, and all that it has, is for us to enjoy and share."

Our 5,300-mile journey around the Rub al Khali brings us, at the end, to the tent of Aedaa bin Hassan—Mr. Kalashnikov. Two nights before, as we made camp in the desert near al Rimah, in northeast Yemen, we

Outside Shibam men gather in a pool of shade to evade the heat of a mid-winter day. In the Sands "there is no rhythm of the seasons," British explorer Wilfred Thesiger observed a half century ago. "It is a bitter, desiccated land . . . yet men have lived there since earliest times." Few in Thesiger's day envisioned the changes that oil riches would bring. Yet even as modernity offers new comforts, the essence of desert life is still age-old tradition, which—like the blinding midday sun—remains a powerful force.



"A VISITOR IS ENTITLED TO ALL WE HAVE—

spent the evening entertaining visitors. From this seemingly empty wasteland, a group of Bedu appeared, shy at first, but with the bravest of them eventually approaching our camp and, wary of being surrounded, moving slowly toward us with shouts of "Salaam Alaikum!" on their lips.

Soon the visitation became a stampede. After entertaining and feeding three different sets of company between sunset and 9 p.m., I grew tired. And this was when a shaybah named Obede bin Mahri—of the powerful Mahrah tribe—arrived by car. I had spent the late afternoon listening to him ("We need schools! We need hospitals! All we have is the Rub al Khali! We need to find more oil in Yemen!"), and he wanted to repay me for listening to his hour-long harangue.

In the back of his pickup, bin Mahri was carrying a goat. "This I want you to have," he told our group. "You have been kind to people in this place, people who you, being Westerners, did not have to accept or try to understand. This goat is for you, to sustain you during your trip. You are my brothers."

And with that he lifted a young goat from the back of his pickup truck, set it on the sand, and drove off into the darkness with a wave of his hand.

So two days later, as I sit in Aedaa bin Hassan's tent next to a pile of automatic rifles and listen to him talk about what it means to be a Bedu, I understand two things.

First, after living among the Bedu for nearly two months, I've learned how much I don't yet know. If I spent the rest of my life among them,



FOOD, TEA, REST, CARE. THAT IS OUR WAY."

I might be able to finally understand the lattice-work of interdependence out here, the life-or-death reliance on the livestock that, in turn, rely upon you. I might fully comprehend why one must extend hospitable kindness toward an enemy in need, despite the tribal raids and blood feuds that have raged here for generations.

Second, I have come to love the place for its simple, hard-won joys: the night stars; the honor and brotherhood with which strangers support one another in an otherwise deadly environment; the viscous, salty taste of a sheep's eye after it has given its life to feed me; the crinkly feeling on my skin after having bathed in a spring-fed oasis pond in the desert's midst, its water infused with below-ground salt.

These joys may not seem like much to someone reading this magazine in modern comfort,

where fresh water flows from taps and companionship is just a phone call away. But in the Rub al Khali, where life hinges on a hundred little decisions every day, and where decency and friendship are as tangible as shade and a sustaining cup of tea or fresh water, humanity means survival.

And this is why, as Aedaa bin Hassan and I sit in the cool shade of his tent, I offer that we should eat the goat in the back of my vehicle together in return for his hospitality.

Bin Hassan, the man who shot over my vehicle 20 minutes earlier, smiles widely.

I take this as a yes. □

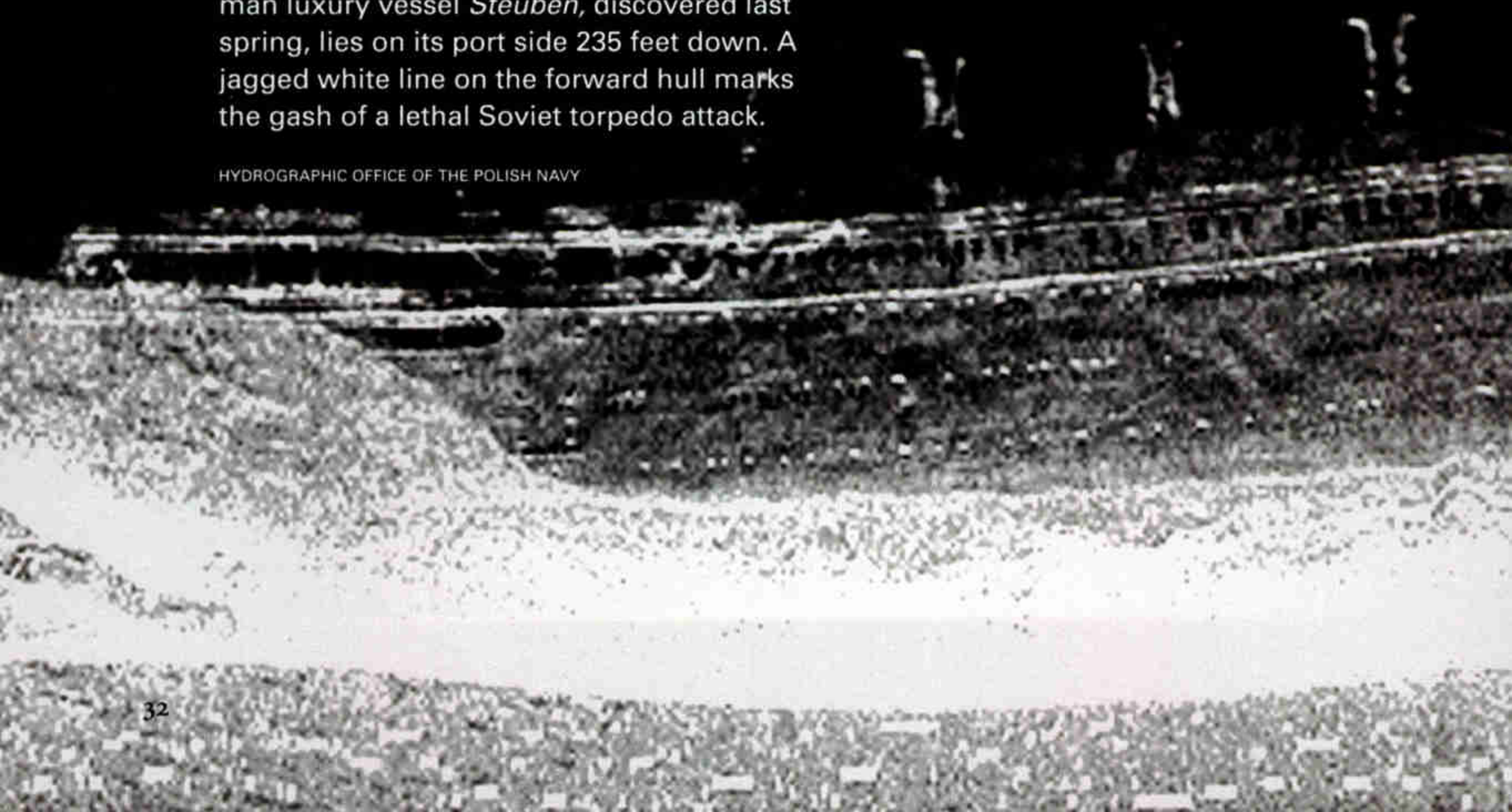
GET A BIRD'S-EYE VIEW from George Steinmetz's ultra-light via video, then experience the Sights & Sounds of the Empty Quarter at nationalgeographic.com/magazine/0502.

FEBRUARY 10, 1945 • 2 TORPEDOES

gdn

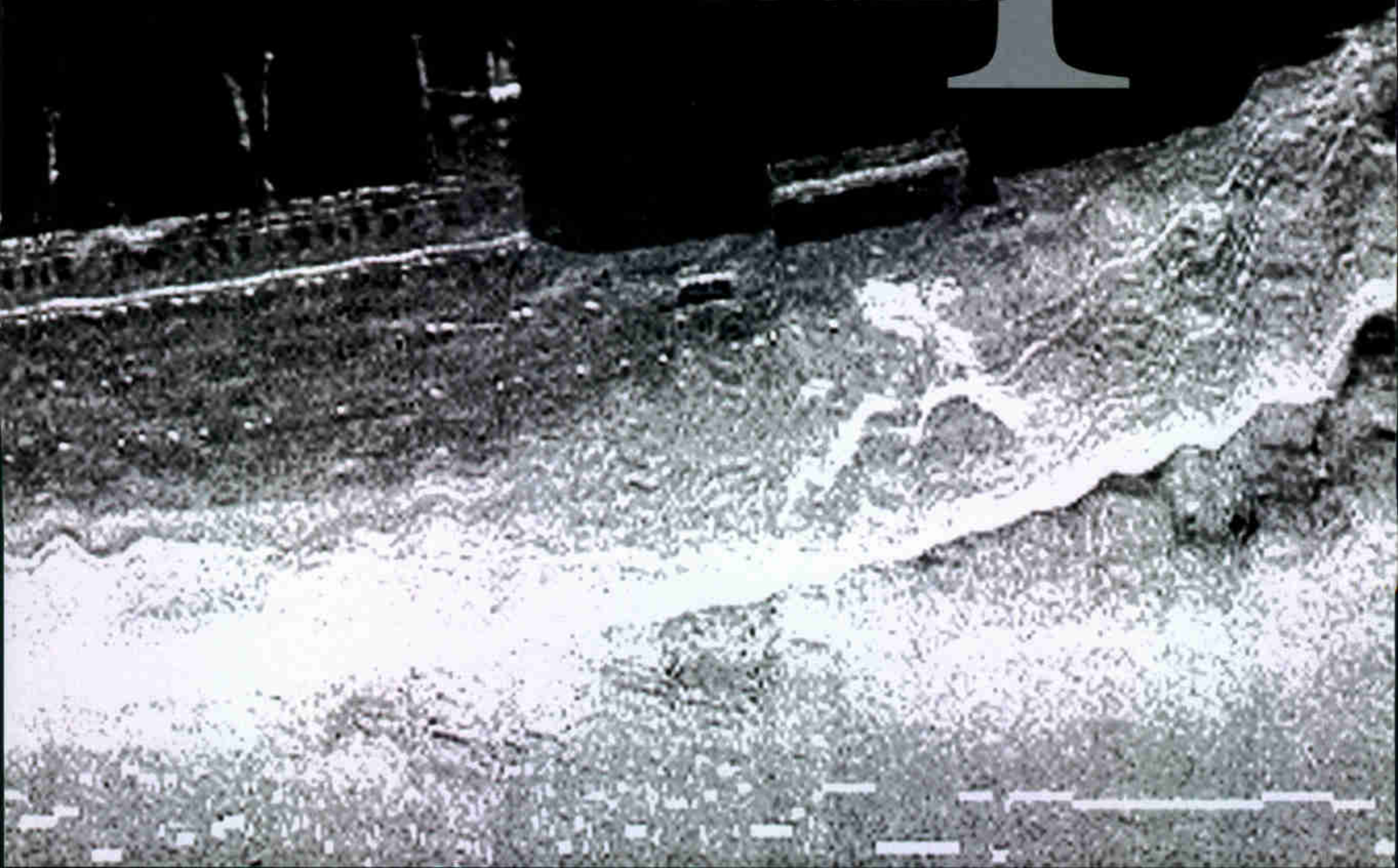
Eerily exhumed by a sonar image made from the surface of the Baltic Sea, the German luxury vessel *Steuben*, discovered last spring, lies on its port side 235 feet down. A jagged white line on the forward hull marks the gash of a lethal Soviet torpedo attack.

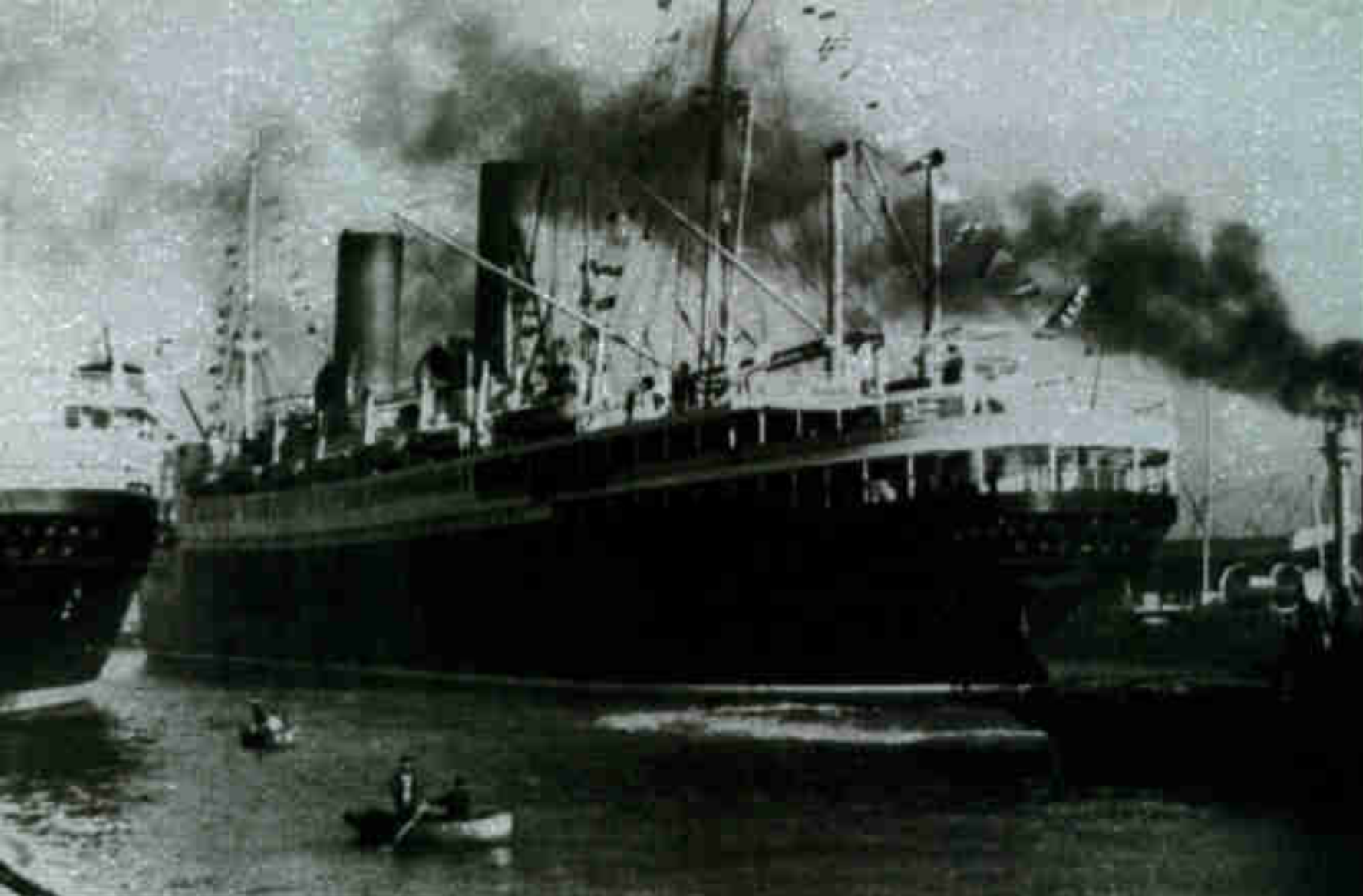
HYDROGRAPHIC OFFICE OF THE POLISH NAVY



EXPLODE • 4,500 PEOPLE DROWN

O.S.T. ship found





As **World War II** neared its bloody finale, the Red Army stormed into East Prussia. In **desperate flight** some 5,200 German **refugees and wounded soldiers** crowded aboard *Steuben*. Hit by a Soviet sub, it sank into icy water—one of the **deadliest sea tragedies** in history. Here is the tale, with **exclusive photos** of the doomed ship at rest in the deep.

Icon of 1930s luxury (top left), *Steuben* later flew the swastika as an armed transport for the Third Reich. A refugee mother and child (right) made the final boarding. Their fate remains unknown.



BY MARCIN JAMKOWSKI

DEPUTY CHIEF EDITOR, NATIONAL GEOGRAPHIC POLISH EDITION

PHOTOGRAPHS BY CHRISTOPH GERIGK

The Baltic Sea was as gray as storm clouds when the four of us jumped into the water. We each had several tanks filled with different mixtures of gases for breathing at depths up to 235 feet—more than twice as deep as conventional scuba diving. The waves kicked us around as we swam, so when we reached the marker buoy, we submerged as quickly as possible, and the weight of our equipment seemed to lighten.

We were on our way to examine the recently discovered remains of *Steuben*, a German ship sunk during World War II with the loss of perhaps 4,500 lives—three times the death toll of *Titanic*. A private Swedish team and later the Polish Navy had both scanned the ghostly wreck with sonar. But only a handful of divers had seen it since it was hit by two torpedoes from a Soviet submarine on February 10, 1945.

By the time we reached 70 feet, the sea was as dark as night: Even with our powerful underwater lights we could see nothing but the dive line from the buoy going down. The deeper we went, the gloomier it felt. Finally at 150 feet a huge shape emerged from the darkness—difficult to recognize at first because it was resting on its side. But as we swam closer, I made out the outline of the gracious ship's hull, crowned with an elegant railing and straight rows of portholes.

Built in 1923, *Steuben* had been converted in 1944 to transport wounded soldiers. Armed with anti-aircraft guns, the 550-foot-long vessel was jammed with more than 5,000 people, including at least 1,000 civilian refugees, when it was attacked 40 miles off the German coast. Only 659 people were rescued from the icy water.

Thoughts of the terrible scenes from 60 years ago rushed through my head as I swam past the promenade deck. I imagined the crowd of people squeezed into the narrow passageways, struggling to reach the stern deck in time to find a raft or a boat. When I peeked inside through the large, smashed windows, what surprised me most was the complete emptiness: no ship equipment, no baggage thrown around, nothing.

The power of the water surging through the decks must have been so tremendous that it swept away everything, leaving just naked walls.

Past the promenade deck I saw the entrance to the concert halls that had been packed with wounded German soldiers, and I knew that inside there must be the remains of thousands of them. I remembered what Polish Navy officers had told me after they'd investigated the wreck in late May 2004. They'd taken a good look at the sea bottom with a remotely operated vehicle and found the entire area around the wreck "covered with human remains, skulls, and bones."

We didn't swim into the ship. Not only because it was dangerous—we might get entangled and run out of air before we could get free—but also because we believed this underwater tomb deserved respect. It was easy to imagine the dramas that had taken place here, having heard the stories myself from some of the last living survivors. Despite what the Nazis had done to my country, I had tears in my eyes as I listened.

Early winter of 1944 was surprisingly warm in East Prussia, a German province squeezed between the U.S.S.R. and Nazi-occupied Poland. Muddy roads had prevented Stalin's tanks from renewing the offensive that had been interrupted a few months earlier. The Soviet commanders were just waiting for a little frost on the ground to smash through the ramshackle defense lines that German civilians had hastily erected.

The frost arrived in the middle of January, and an avalanche of 200 Soviet divisions rushed forward along the eastern front. The dwindling armies of the Third Reich could not stop them, the front line shattered, and soon the roads were filled with retreating German soldiers. Ivan's coming! they told civilians. Run!

German residents knew all too well what an encounter with the incoming Soviet Army could mean, having heard the story of Nemmersdorf (Mayakovskoye), a village in East Prussia overrun by the Soviets the previous autumn. There



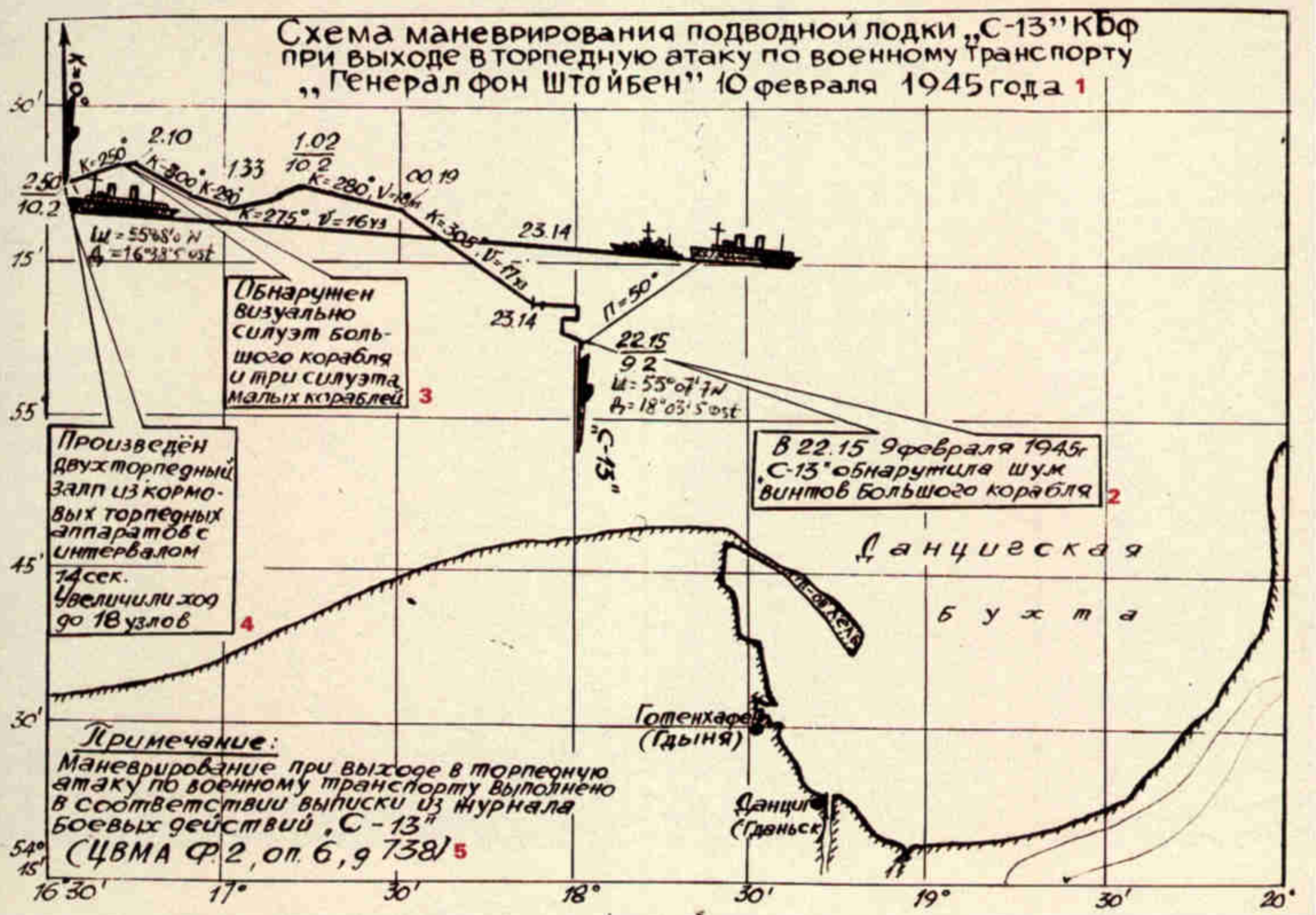
From Victory to Disgrace—and Back



With a shark's instincts Capt. Alexander Marinesko (above left) held the record among Soviet submarine skippers of World War II for the most tonnage sunk in a single cruise (about 40,000). While commanding the *S-13* (top), his lethal aim with 533-caliber torpedoes (above right)—which scuttled *Wilhelm Gustloff* and *Steuben*—earned him the Combat Order of the Red Banner (left). But insubordinate conduct on shore offended superiors, who discharged him after the war. Finding work at a blood-transfusion institute, Marinesko quarreled with the director, who later accused him of theft. He served 18 months in a labor camp, then was released. Marinesko died of cancer in 1963. In 1990 President Mikhail Gorbachev enshrined the sailor's legacy with the Motherland's loftiest title: Hero of the Soviet Union.

Routes to Tragedy

Heading west for safe haven, *Steuben* left Pillau on February 9. Marinesko soon spied a glow from the smokestacks of *Steuben's* coal-fired escorts, running at full power to stay with the faster ship. Four and a half hours later, he fired two torpedoes (art, facing page); *Steuben* went down in 20 minutes. A frantic rescue saved 659 lives.



The hunter stalks his prey in a postwar chart reconstructing the attack. A translation of the Russian notes reads: **1** Schematic of Maneuvers by Submarine *S-13* of the Baltic Fleet during commencement of the torpedo run on military transport *General von Steuben*, February 10, 1945. [The C in *C-13* is translated into an S in English.] **2** At 22:15 February 9, 1945, *S-13* detected propeller noise of a large vessel. [The hour, 10:15 p.m., was two ahead of local time. The submarine's clocks were set to match those in Moscow.] **3** Visually detected silhouette of a large vessel and three silhouettes of small vessels. **4** Executed two-torpedo volley from stern torpedo tubes with interval of 14 seconds. Increased speed to 18 knots. [A stern launch positioned the sub for a swift escape.] **5** Note: Schematic of torpedo-run maneuvers against the military transport was drafted in accordance with the *S-13* battle log.



the Red Army had taken bloody revenge for three years of suffering caused by the German invasion of Russia. After seizing the village, the soldiers had first raped all women, regardless of age, then had crucified them on doors of barns and houses. Men and children had been clubbed to death, shot, or run over with tanks. When Germans later retook the village, they invited reporters from neutral countries—Sweden, Switzerland, and Spain—to see what the Red Army had done. German theaters were soon showing a horrifying newsreel filmed in the village.

Near the end of January, Helene Sichel-schmidt, a 19-year-old kindergarten teacher, was working at her school in Aweyden (Nawiady) when fleeing German soldiers brought wounded to the courtyard.

"They were exhausted from the fight and frightened," she remembers. "They warned us that the Russians had surrounded East Prussia and that it was time for us to run away." Together with Marti Gleich, a friend from work, Sichel-schmidt decided to escape, taking only a small suitcase she had with her at school.

The two young women found the roads jammed with an endless river of refugees. Dodging strafing runs by Soviet planes, the pair spent nights in abandoned homes or in car wrecks on the road. After two weeks of wandering in the snow, sometimes on foot, they were finally transported in a fishing boat taking soldiers across Frisches Haff (Vislinkiy Zaliv) to the Baltic port of Pillau (Baltiysk). The town had a depressing look. Bombed a few days earlier, it was full of wounded from the eastern front. Refugees at one point outnumbered inhabitants by four to one.

"The port was full of soldiers in bandages soaked with blood, many lying on stretchers outdoors," Sichel-schmidt says. "They asked for water, for help. There were also many refugees like us looking for a chance to get on a ship."

In the middle of January, Germany had begun Operation Hannibal, a naval withdrawal that grew to include civilians in the largest maritime evacuation in history. Over a period of four months nearly 1,100 German ships would transport some 2.4 million people to safety across the Baltic Sea. Every sort of ship would sail west from Pillau, Danzig (Gdańsk), Gotenhafen (Gdynia), Zoppot (Sopot) and Hel: ocean liners, naval vessels, merchant ships hauling refugees in cargo bays formerly used for iron ore,

Lighting a Dark Chapter

The fatal torpedo wound gapes at Steffen G. Scholz, part of a 17-member team that visited the wreck last August. "I could see a pipe, doors, stairs, everything crushed," he says. "I'm a sea captain, and to see a hole like this in the hull of a ship is not a good feeling."

even small fishing boats. The main staging point for refugees was Pillau; from that port alone 441,000 people would be transported to Germany proper.

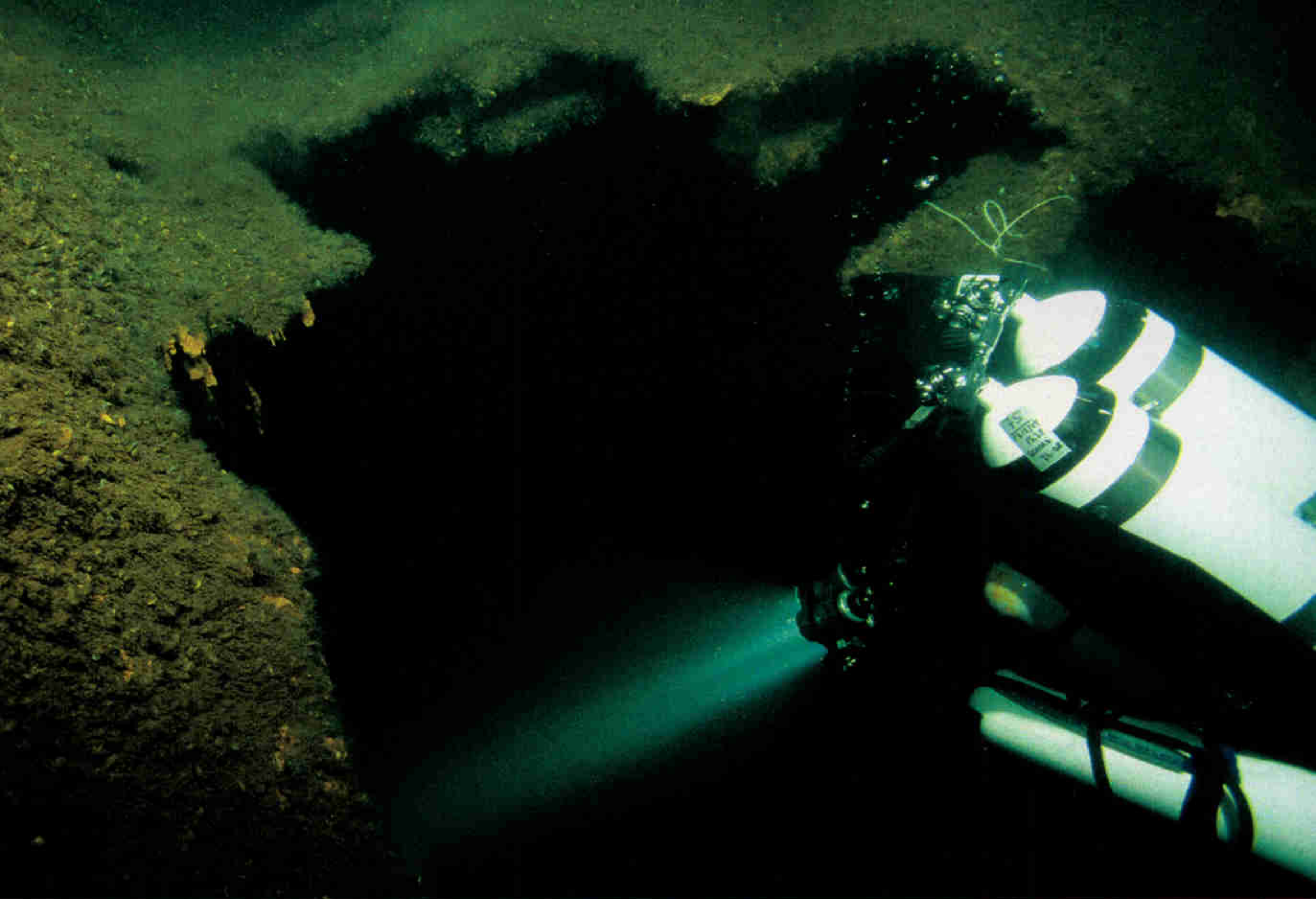
Steuben had recently entered Pillau after the ship's second voyage across the Baltic with evacuees. Described as the "beautiful white *Steuben*" in prewar advertisements, the luxury liner was originally owned by North German Lloyd of Bremen. Pictures from the era show art-nouveau-inspired cabin interiors, cozy concert halls, and stylish smoking parlors.

When the war began, the ship was transformed: The elegant white hull was repainted with shades of camouflage gray, and the decks where vacationers used to linger were equipped with antiaircraft guns.

"Despite the changes you could still smell the lingering aroma of the luxury there," says Paul Niehaus, who was a steward on *Steuben*. In Pillau on February 9, 1945, Niehaus watched as the ship, which had an official capacity of just under 1,100 passengers, took on several times that number.

"The most severely wounded soldiers had priority in boarding," says Joachim Wedekind, a merchant marine officer now living near New Orleans who was also on *Steuben* that day. Temporarily assigned to the port of Pillau as a boarding officer, Wedekind was on his way to Swinemünde (Świnoujście) to catch up with M.V. *Marburg*, a hospital ship of which he was captain. During *Steuben*'s fatal voyage he assisted the ship's officers with some of their duties.

"All the cabins, halls, and corridors were filled with wounded soldiers," he remembers. When it seemed that nobody else could squeeze onto the ship, *Steuben*'s captain, Karl Homann, defying Hitler's orders, decided at the last moment to admit an additional thousand refugees. They were told to leave their luggage on the pier and find room for themselves among the wounded in the crowded corridors. Before



the ship left, says Wedekind, “we estimated that we had 5,200 people on board.” But the captain reported only 4,200.

One of the wounded soldiers who managed to get on *Steuben* was Gerhard Döpke. Today a retired teacher, he’d trained as a pilot in the German Luftwaffe until fuel shortages had forced planes to spend most of the time sitting in hangars. Then he’d been sent to join the ground forces, ending up with the Hermann Göring division on the eastern front, where he’d found “mud, hunger, and death.”

In late January 1945, Döpke was severely wounded in the head and arm by an exploding grenade. “I had 30 pieces in my body. I was semi-conscious when I was transported through Königsberg (Kaliningrad) to Pillau in a hospital train,” he recalls. There he was taken aboard *Steuben* on a stretcher. “The severely wounded were placed on the upper decks,” he says, “and that saved me.”

As wave after wave of wounded soldiers flooded *Steuben*’s decks, Helene Sichelschmidt and Marti Gleich watched from shore, having taken shelter in the snow-covered wreck of a truck. Then a sailor from *Steuben*’s crew, walking along the shore, asked if they wanted to come

aboard. Later he and another seaman helped them squeeze through a porthole. “The sailors were on watch at the time, so they let us use their cabin,” she says. “For the first time in two weeks we could wash up and sleep in real beds.”

In the early afternoon of February 9 *Steuben* raised mooring lines and set off from Pillau, sailing at 12 knots toward Swinemünde two days away. Until the ship reached the Hel peninsula, *Steuben* was escorted by a single minesweeper. After that, two aging torpedo boats accompanied the ship.

The weather was a nice surprise, becoming slightly warmer in the afternoon, the temperature close to 32°F. After sunset a cold but quiet night arrived, the wind died down, the sea was calm, the moon appeared, and the sky was full of stars. In the makeshift operating rooms surgeons tended to the most severely wounded, and three babies were delivered. The atmosphere was jubilant, with soldiers and refugees alike happy to get out.

The captain had only one worry: Soviet subs. Until recently German naval commanders hadn’t considered them much of a threat. But just ten days earlier, a Soviet sub had scored a spectacular victory.

The ship was already tilting; people, in unspeakable panic, were jumping into the frigid water.

That submarine, *S-13*, was commanded by a skillful and brave officer, Alexander Ivanovich Marinesko. The Ukrainian-born seaman with Romanian roots had come to Leningrad (St. Petersburg) as a young man, where he'd quickly risen in the naval ranks. "The crew loved him, the sailors respected his successes in the fight, but the high command didn't like his impulsive character and sharp tongue," says his daughter, Tatiana Marinesko, as we talk in her apartment in Kronstadt, Russia.

In late 1944 the *S-13* was stationed at a base in Turku, Finland. "Marinesko was very demanding and punctual at sea, but on shore he would immediately loosen up," says Alexander Shagin, director of the A. Marinesko Museum of Submarine Forces of Russia in St. Petersburg. Stories about Marinesko's partying have grown over the years. On New Year's Eve he met a Swedish woman, an owner of a Turku restaurant, and they decided to spend the evening together.

When Marinesko's superior wanted to talk to him about plans for *S-13*, a hectic search began for the submarine commander. One of the sailors found Marinesko at the restaurant. But the commander ignored the order to return and did not come back to his boat until morning.

A storm erupted over Marinesko immediately. If he'd pulled a similar stunt at the beginning of the war, he'd probably have been court-martialed or shot. But toward the end of the war experienced commanders were as precious as gold. So his superior gave him one last chance, sending him back to sea. "I'll be waiting for your victories," he said.

Marinesko took the order to heart. When his watch officer informed him that there were enemy ships nearby on January 30, he decided to give chase. A few minutes after 11 p.m. Moscow time, as recorded in *S-13*'s log, he launched three torpedoes into the armed transport *Wilhelm*

Gustloff, a converted ocean liner filled with refugees and wounded soldiers.

The ship, more than 650 feet long, started sinking immediately, carrying perhaps as many as 9,000 people to their death. It may have been the largest sea tragedy in history; the next largest would be the sinking of *Goya* by another Soviet submarine in April, with between 6,000 and 7,000 people on board. Both were part of the evacuation of soldiers and civilians.

Just after 10 p.m. (Moscow time) on February 9 the crew of *S-13* saw the glow from the smokestacks of *Steuben*'s escorts. *S-13*'s sonar operator mistook the sound of *Steuben*'s propellers for those of a German cruiser. Marinesko began to stalk his target.

Suddenly, however, one of the escort vessels turned and headed straight for the submarine. Marinesko sent *S-13* into a crash dive. It was an hour before the submarine was able to resume the chase. After shadowing *Steuben*'s little convoy for nearly two hours, Marinesko made his move. At 2:50 a.m. he ordered crewman Vladimir Kurochkin to launch two torpedoes at *Steuben* from the aft tubes.

"I was awakened by a terrible bang," Paul Niehaus remembers. "A shiver went through the ship that shook me out of my bed. I'd lived through the sinking of another ship, so I had a hunch what might be happening." The torpedoes hit the bow, killing most of the crewmen in that area. Niehaus, who slept in the stern, survived the impact. "I ran toward the deck. On my way I heard shots reverberating through corridors. A few severely wounded soldiers who'd lost all hope were committing suicide."

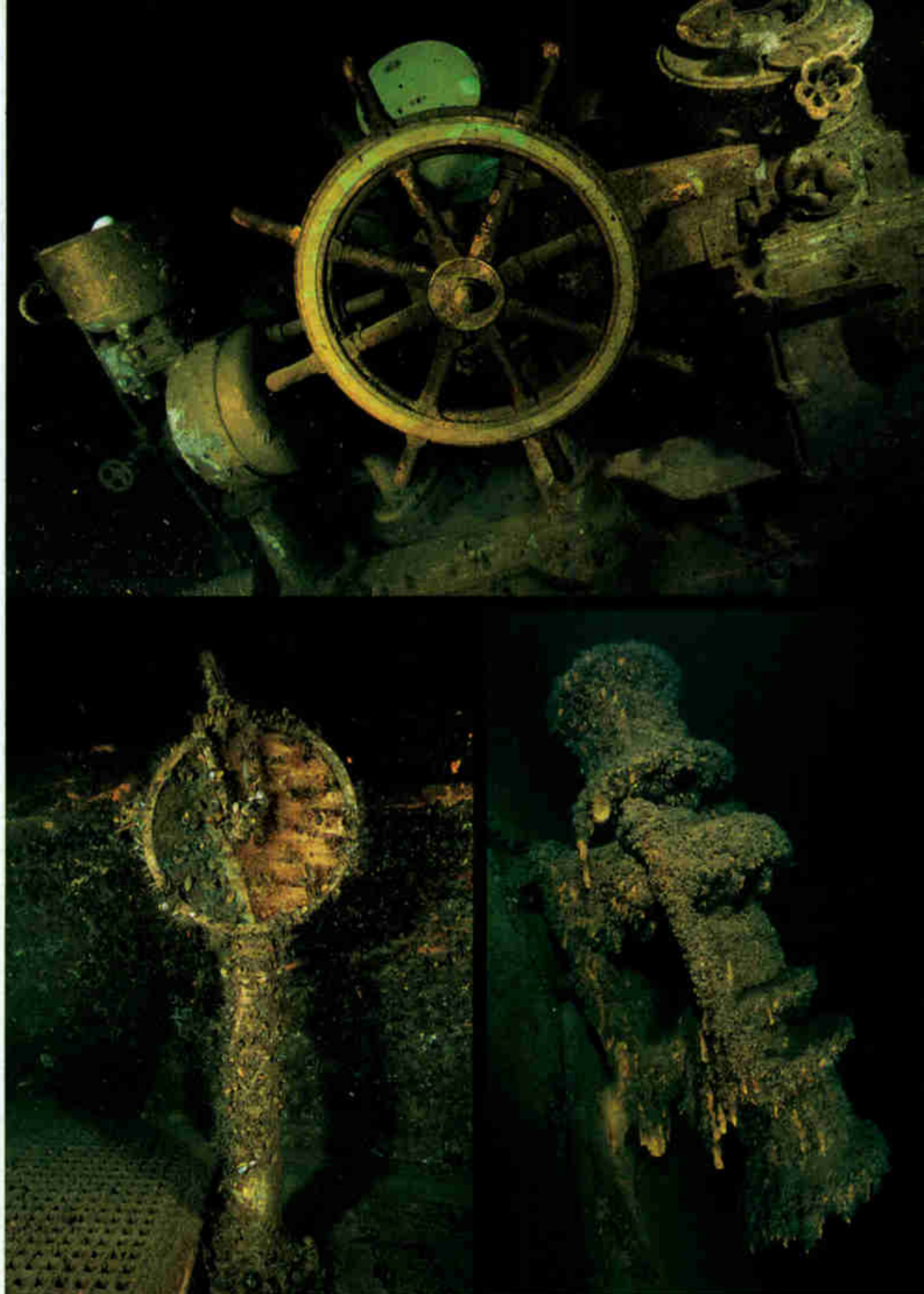
When Niehaus reached the deck, the ship was already tilting; people, in unspeakable panic, were jumping into the frigid water. "I ran toward the inflatable rescue rafts and threw one of them into

the water," Niehaus says. "But when I went to jump into it, I saw other people had already climbed in. So I threw another one, and the same thing happened. The third time I tied the raft to myself with a rope before I jumped overboard with it. Two civilians, a nurse, and a wounded soldier joined me. A few more people clung to the side of the raft, but they all died within minutes in the icy sea."

Gerhard Döpke, meanwhile, was fighting for his life, his right hand immobilized with bandages. "I started to crawl up steep stairs with one hand, but the surging crowd pushed me down twice," he says. "When I heard the shots of the suicides, I knew I had to rescue myself. With my last bit of strength I reached the deck and crawled toward the railing. The ship was already sliding into the depths, when a huge wave swept me into the sea. I grabbed a piece of a board in the water, but it was too small and I nearly sank. I began to pray then, and I remember saying, 'Lord, let me not drown like a rat.' And then a miracle happened: An empty life raft floated right onto me. I grabbed the rope of the raft with my teeth and started climbing into it with my good hand. When I managed to get in, I fell on my face, exhausted. Soon after, someone climbed over me, then another person, and my face ended up just above the surface of the water. I shouted with all my strength, 'Don't let anyone else in because I'm going to drown,' and I lost consciousness for a few hours."

Helene Sichelschmidt and Marti Gleich, awakened by an explosion, immediately ran into the corridor. "The soldiers were calming everybody down, saying that it was nothing major, just two ships had collided," Sichelschmidt says. "But I didn't trust them. The ship was lying on its side." Holding hands, the two young women made their way through crowded corridors filled with refugees screaming in panic, heading toward the upper levels of the ship.

"I was holding some kind of a ladder when the ship tilted rapidly. My legs dangled in the air. I would have fallen and never reached the



Navigation Graveyard

Tools of the trade from *Steuben's* deck haunt the deep. On the captain's bridge sits the steering wheel (top), as well as a telegraph (above left) that enabled communication with the engine room. A rusted anchor winch (above right) once shouldered two 3.5-ton anchors.

deck if not for a soldier who was below me. He pushed me up, and Marti grabbed my hand. Nobody who was behind me got out," she remembers. When the pair reached the deck, they saw they were on the bow. Figuring the ship was going down, they removed their shoes, held hands, and waited until the water took them.

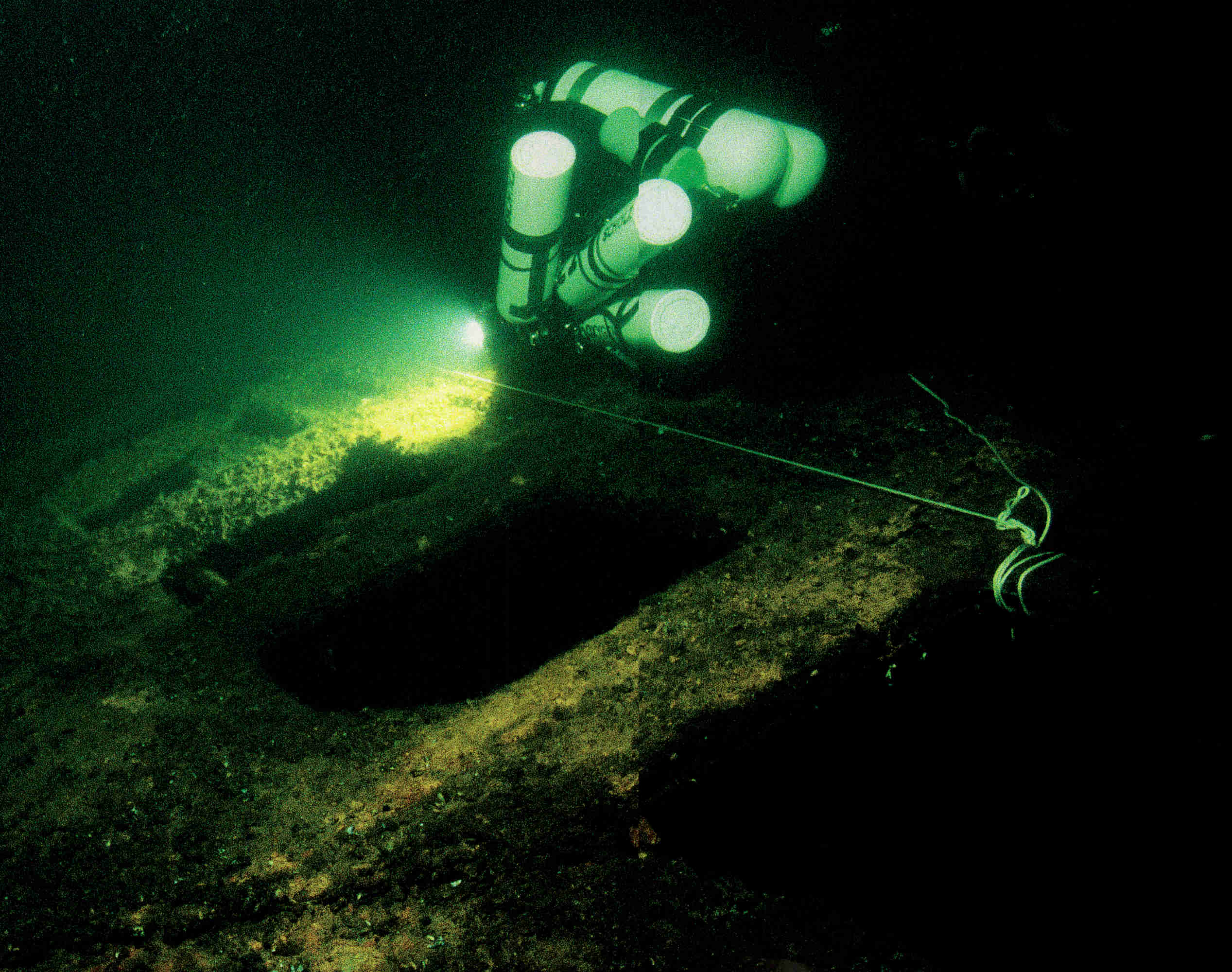
"I don't even know when I went under the water," Sichelschmidt recalls. "When I reached the surface Marti was not near me. I called her name, but there was no answer." Sichelschmidt soon reached a life raft. She never saw her friend again. In less than 20 minutes *Steuben* had vanished beneath the waves. (Continued on page 50)

Thoughts of terrible scenes from 60 years ago rushed through my head as I swam past the promenade deck.



Steuben's decks went from refuge for tourists (above) to steerage for refugees (below) to sea-embalmed ruins (right). Exploring the promenade deck in August 2004, diver Scholz needed a guideline through the murk and five tanks with mixes of helium, oxygen, and nitrogen to ward off narcosis. A small sixth tank released argon gas into his suit as extra insulation in the 37°F water.



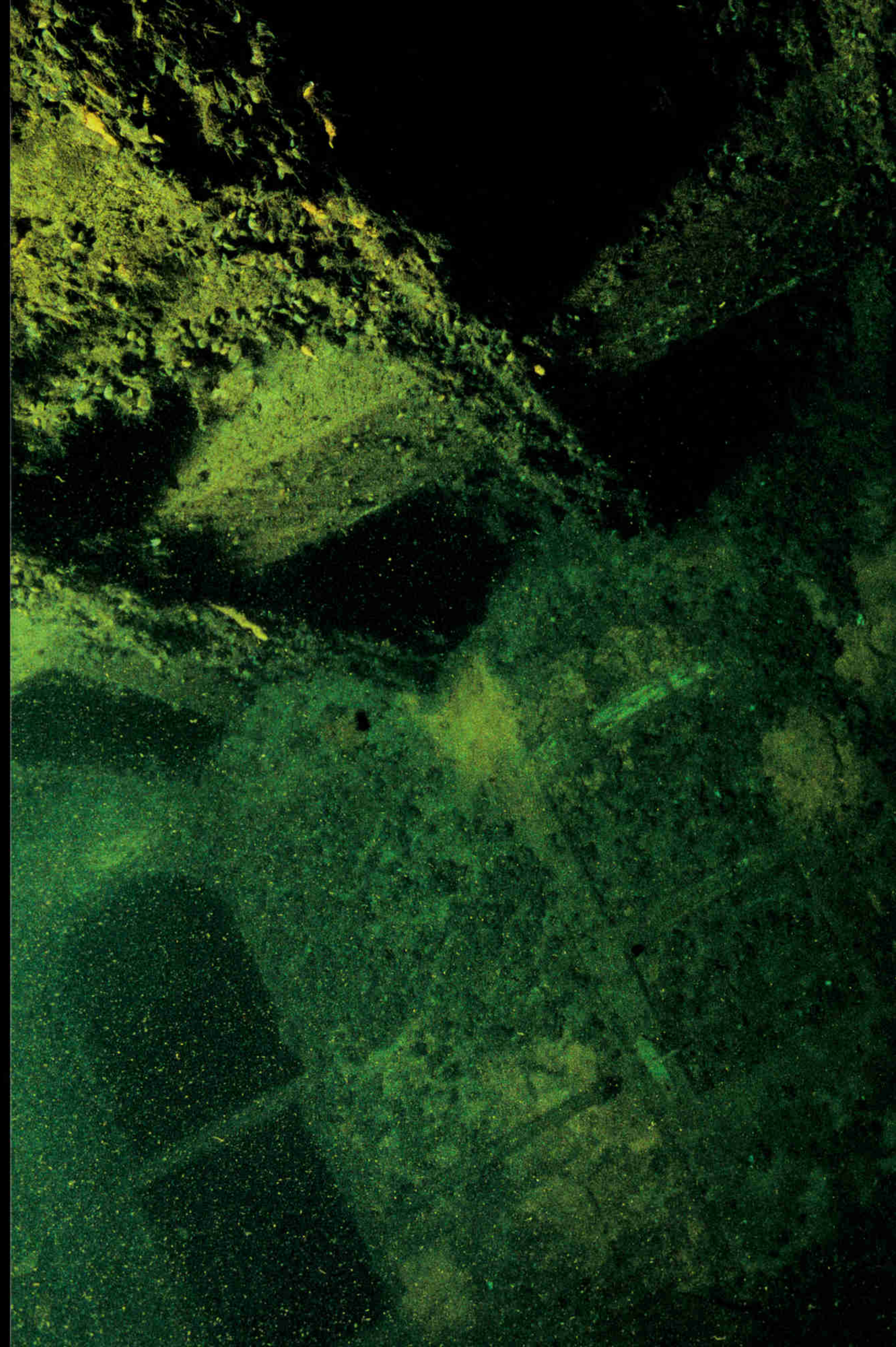




Riches to Rags

Fine parlors such as the Small Hall (above) were filled with wounded German soldiers (below) from the eastern front. As loading continued, bloodied and bandaged soldiers packed even the floors. Today brine coats the hall's windows (right). Joachim Wedekind survived the disaster. "I was picked up by a mine-sweeper," he says. At age 22 the merchant marine officer had already survived five other sinkings. "I felt like a cat with nine lives."

OSTSEE-ARCHIV HEINZ SCHÖN (ABOVE AND BELOW)





Paying Proper Respects

Six decades of abandoned fishing nets blanket *Steuben's* stern (above). "It's a shroud of sorts," says photographer Christoph Gerigk. The team knew that from stern to bow (right) the wreck would be full of human remains and chose not to enter out of respect. "It's a grave," says Gerigk. "We have been there to see the necessary minimum to document it. I am not willing to return."

Pleased with his success, Marinesko returned to Turku convinced that sinking two Nazi ships within two weeks would be the turning point of his career. He was even hoping to be awarded the prestigious title of Hero of the Soviet Union.

"There was a huge feast waiting for him, with two roasted pigs for two sunk ships, when he came back to port," says Boris Medvedev-Marinesko, a stepson of the *S-13* commander.

But despite his achievements Marinesko's superiors hadn't forgotten his earlier insubordination. So Marinesko was awarded the less prestigious Combat Order of the Red Banner. "He kept his disappointments to himself," says Medvedev-Marinesko. "But you could tell he never accepted that."

After the war, headquarters lowered Marinesko's military rank by two grades and tried to transfer him to a minesweeper. When he refused, he was removed from the Navy. He attempted to work in the merchant marine but resigned because of problems with his eyes.

Later, as a deputy manager at a blood transfusion institute, he fell into trouble again: One freezing winter he let his employees take home briquettes of peat from a courtyard. Accused of stealing state property, he was sentenced to three years in the Far East at Vanino harbor near Vladivostok.

"A snowstorm covered our entire house up to

its roof," he wrote one day to his wife. "In order to get out, we had to crawl through a hole in the roof." Released after a year and a half, he returned to Leningrad. He died of cancer in 1963. Three decades later, just before the Soviet Union fell apart, Mikhail Gorbachev awarded Marinesko the title Hero of the Soviet Union.

His tomb in St. Petersburg is granite with gold letters, his bust positioned high above the ground. As I stood before it, I tried to understand the man. Was he a killer of refugees, as some people in Germany would describe him? Was he a tal-

ented sailor who made "the attack of the century" on an armed ship carrying enemy soldiers, as his supporters say? Or was he perhaps a free-spirited warrior for whom battle was simply an opportunity to shine?

And finally: Did he have the right to shoot at those ships? I pose this question to Heinz Schön, a survivor of the *Gustloff* and the author of a dozen books on German naval warfare during World War II. After hesitating for a long time, he answers with a resolution I find surprising.

"We were the oppressors," he says. "We attacked Poland; we started the war."

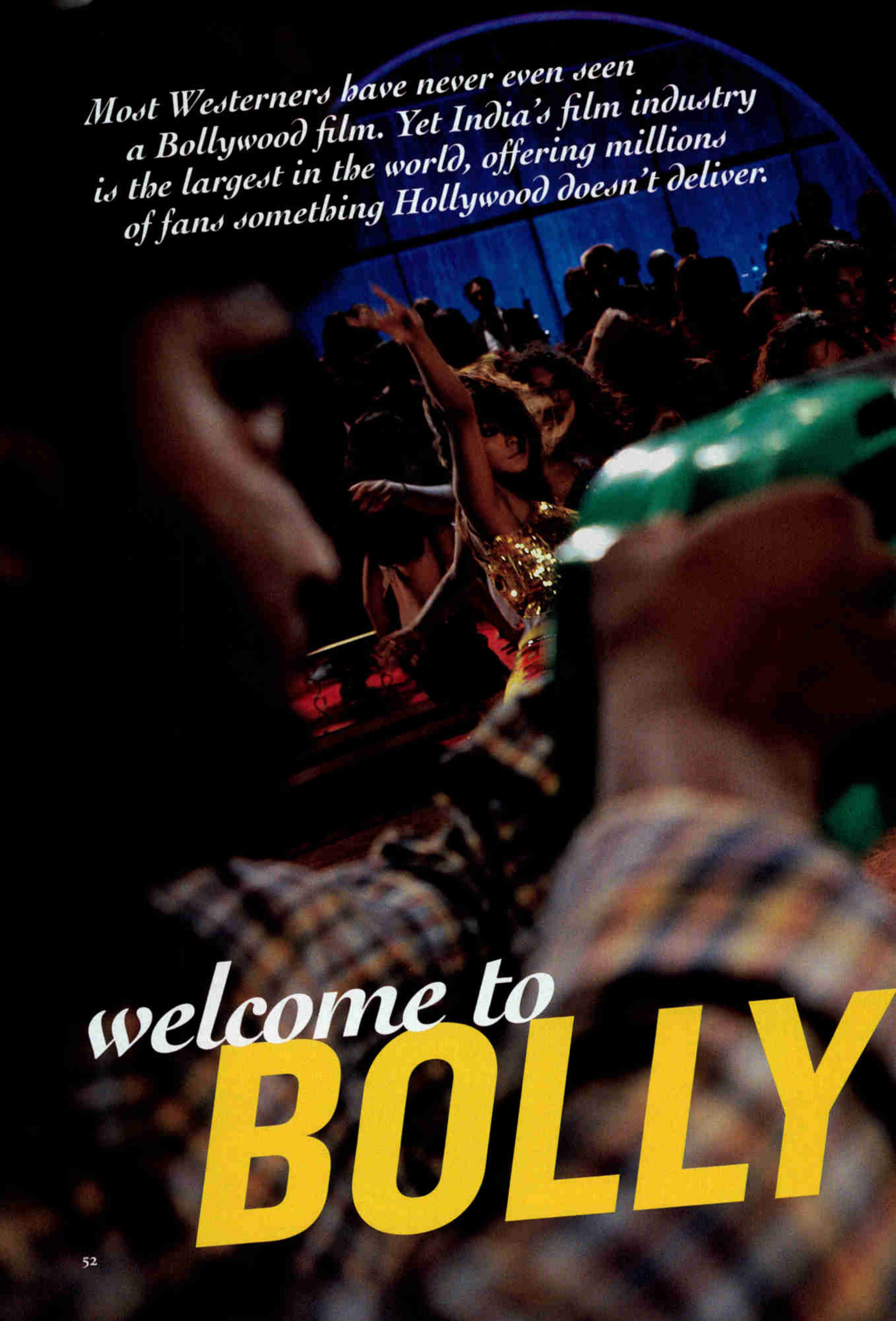
Our ten-day expedition was nearly at a close when Heinz Peters, a diplomat at the German Embassy in Poland, came to pay his respects to the dead.

"May the peoples living on the shores of the Baltic Sea never again witness war. It was the war, started by Germany, which as a last and tragic consequence claimed the lives of those whom we today remember," he said, laying a large bouquet of red and white flowers on the dark water.

The flowers floated for a long time before they vanished beneath the rising swells. □

DEEP DANGER Hear photographer Christoph Gerigk talk about the deadly hazards of diving on *Steuben's* net-shrouded wreck at nationalgeographic.com/magazine/0502.



A woman in a gold sequined outfit is dancing on a stage, surrounded by a large crowd of people at night. The scene is illuminated by stage lights, and a green car is visible in the background.

*Most Westerners have never even seen
a Bollywood film. Yet India's film industry
is the largest in the world, offering millions
of fans something Hollywood doesn't deliver.*

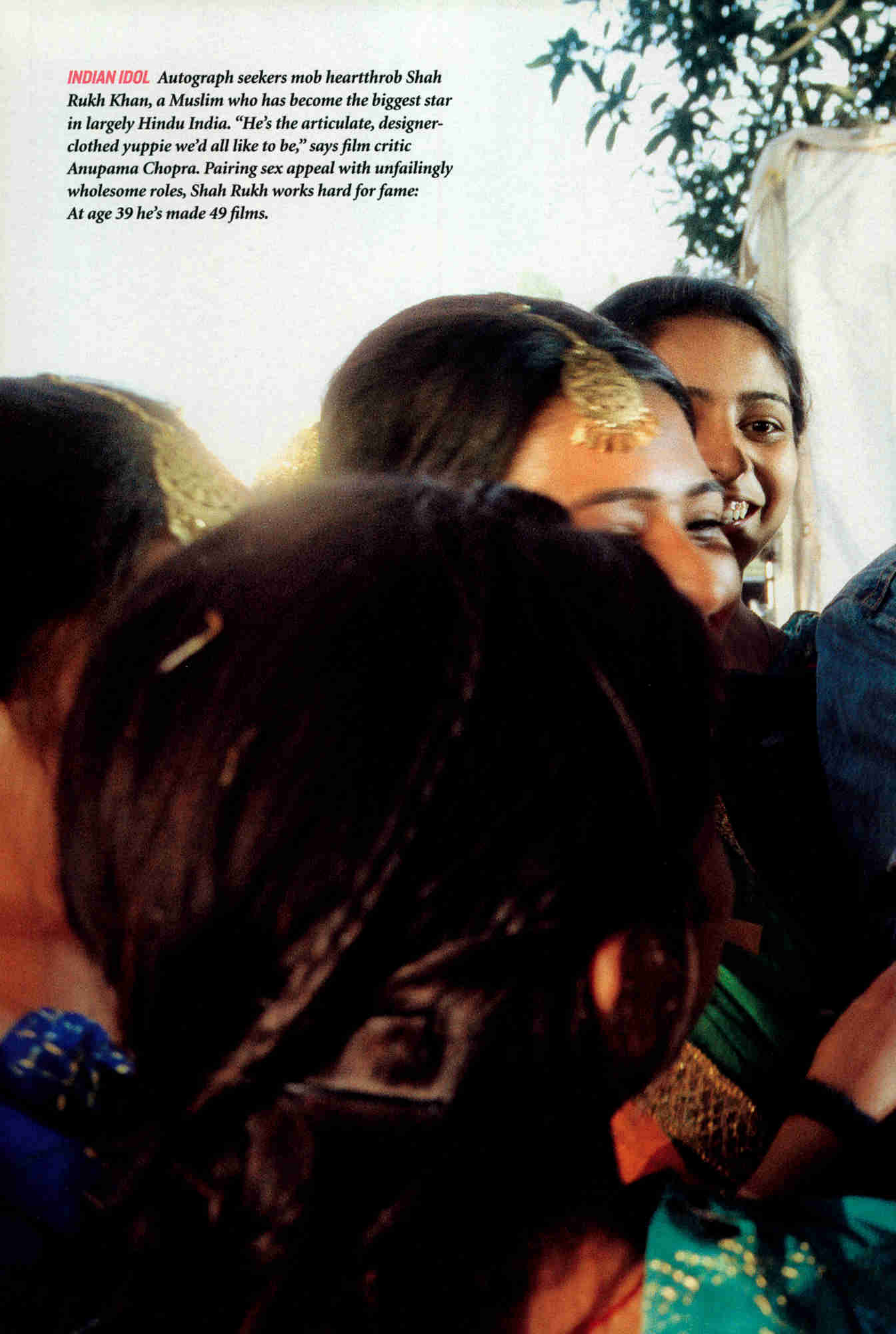
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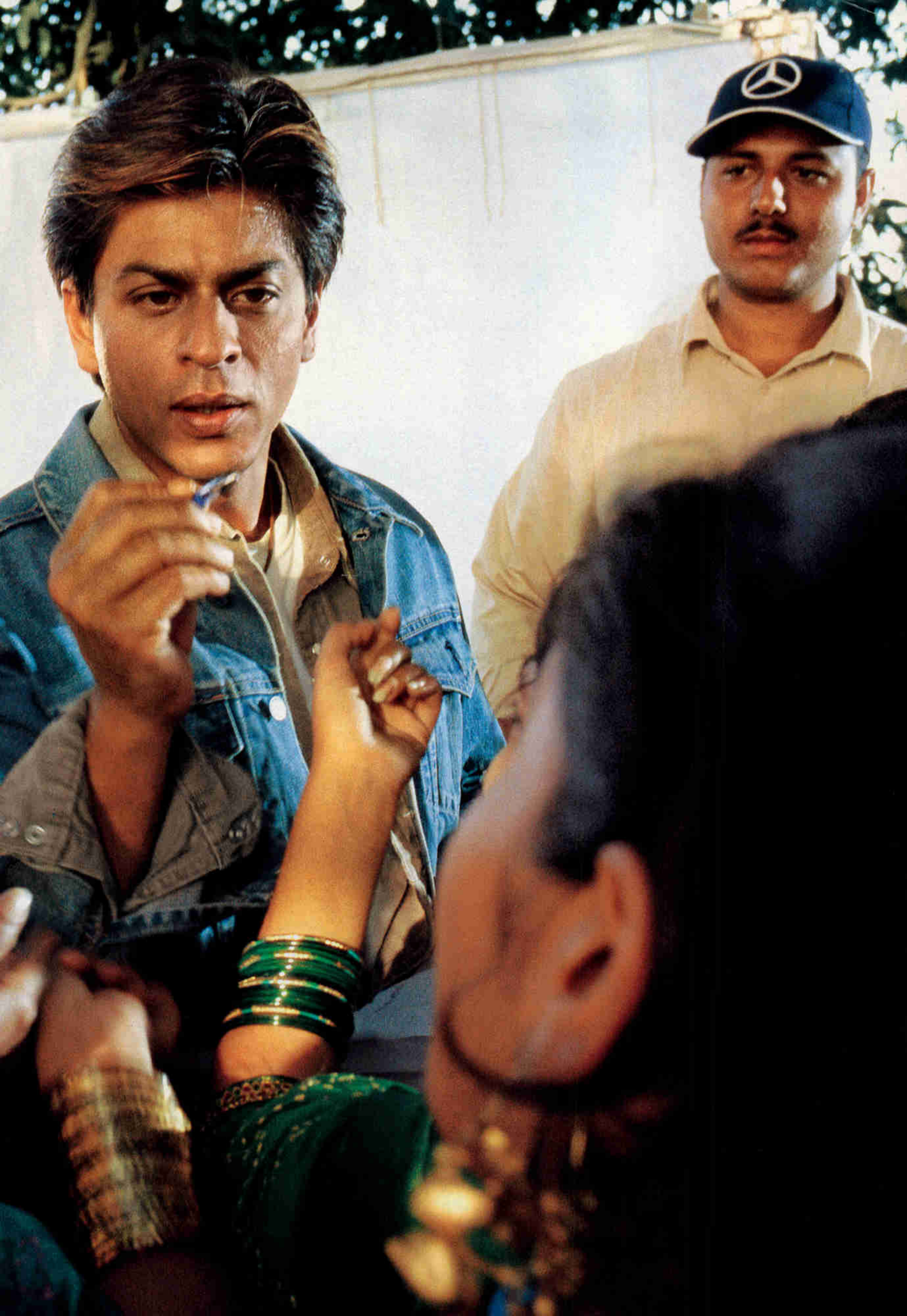
A full-page photograph of actress Rimii in a vibrant yellow, long-sleeved, sequined dress, dancing energetically on a reddish-brown floor. She is wearing black platform boots and has a joyful expression. In the background, another woman in a pink top and skirt is also dancing, and other people are partially visible, suggesting a busy movie set environment. The word 'WOOD' is printed in large, bold, yellow letters across the bottom of the image.

WOOD

BLOWN AWAY Fake wind fluffs an up-and-coming actress named Rimii as she vamps on a movie set in Mumbai (once Bombay), birthplace of Bollywood.

INDIAN IDOL Autograph seekers mob heartthrob Shah Rukh Khan, a Muslim who has become the biggest star in largely Hindu India. "He's the articulate, designer-clothed yuppie we'd all like to be," says film critic Anupama Chopra. Pairing sex appeal with unfailingly wholesome roles, Shah Rukh works hard for fame: At age 39 he's made 49 films.





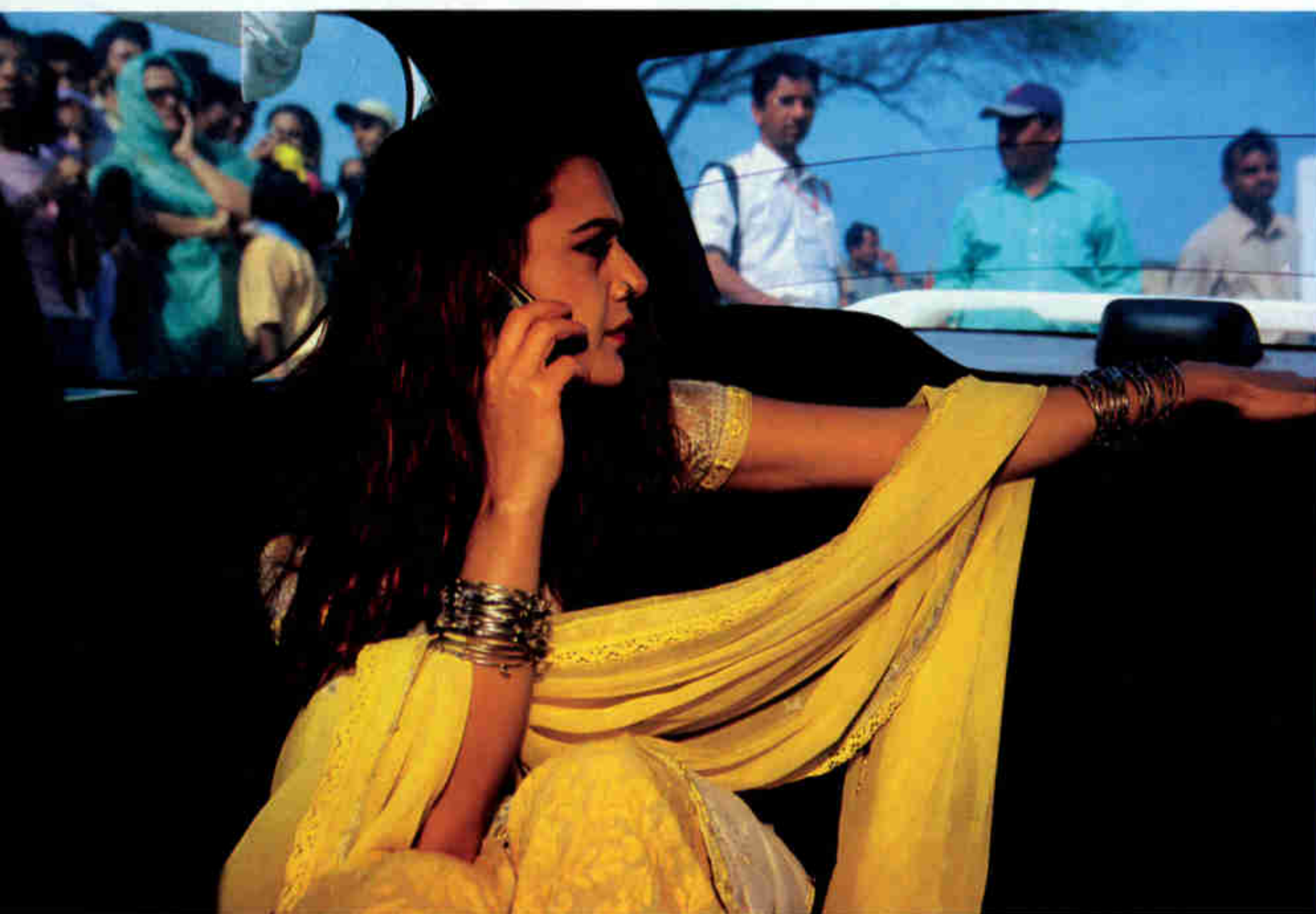
BY SUKETU MEHTA

PHOTOGRAPHS BY WILLIAM ALBERT ALLARD

NATIONAL GEOGRAPHIC PHOTOGRAPHER

Shah Rukh Khan is God.

The woman in the bright red sari knows he is. As the film star and his entourage pull into the driveway of a five-star hotel in Chandigarh, capital of the Indian state of Punjab, a horde of screaming girls run at Shah Rukh as he gets out of the car. The woman in the red sari, who is a middle-class mother of two in her 30s, is jumping up and down, hysterical, on the verge of tears. “Shah Rukh! Shah Rukh!” she hollers, with all the air in her lungs. While bodyguards clear the way to the hotel entrance through the mob,



SITTING PREITY Celluloid diva Preity Zinta heads to a set of the film *Veer-Zaara*, which screened last November in posh venues like the new multiplex in Mumbai (right), part of a chain replacing local theaters. In a modern twist on the standard star-crossed lovers' plot, an Indian man falls in love with a woman from Pakistan, India's nemesis. Cultural differences blur in the industry itself, which is open to all castes and religions.



Shah Rukh's pen is zipping over pieces of paper thrust his way; he is the fastest signer I've ever seen.

But the crazed woman, Shanno Singh, wants something else. She wants to touch him. "We believe Shah Rukh is God, who has incarnated Himself on Earth," Singh says, her young son holding on to her arm and looking embarrassed. So she fought with her husband and dragged her son here, to the hotel where God is staying, to answer one question: "Is He really like us?"

Shanno Singh will probably never be able to touch Shah Rukh Khan in the flesh. Instead, she will have to worship in the same temple his millions of other devotees do: The cinema, where Shah Rukh Khan is the most popular figure in the most popular art form on the planet. India's film industry—often referred to as Bollywood since many of the movies are made in Mumbai, formerly known as Bombay—is the biggest in the world, producing more films and drawing a larger audience than Hollywood. The United States produced 600 films in 2003, while India

produced 1,100 the same year, a third of them in Hindi, India's official language. And Indian films draw a global audience estimated at 3.6 billion annually, a billion more than Hollywood.

Bollywood has become a globally recognized brand; like Darjeeling tea or the Taj Mahal, it has become an emblem of India. Its films are popular in the Middle East, Central Asia, Africa, Latin America—and now the U.S. and Europe, where immigrants from Bollywood-loving countries make up most of the audiences and provide more than 60 percent of overseas revenues. With the recent buzz surrounding Bollywood-inspired films like *Bride and Prejudice* and *Monsoon Wedding*, and the nomination of one—*Lagaan*—for a 2001 Oscar, even Hollywood is starting to take notice of its rival.

Still, most Westerners—if they've even seen a Bollywood film at all—find them far too unsophisticated and melodramatic. Most are three-hour-long extravaganzas in which the stars frequently break into elaborate song and dance



numbers. The plots are far-fetched, built on coincidences and unrealistic expectations. The actors change costumes (from saris to miniskirts, from business suits to kurtas) and locations (from the beaches of Goa to the mountains of Switzerland) multiple times within a single song. But the audience doesn't mind. Like fans of Hollywood films of the 1930s and '40s, Bollywood fans want to enter a magical realm where the impossible is possible, where true love conquers all, where history is defeated by sentiment.

I grew up with Bollywood films as a child in Bombay and as a teenager in New York. I remember other immigrants in our building in Jackson Heights tuning in to Channel 47 to watch the Hindi movie show "Vision of Asia." The Indians sang along to the songs; the

during a folk festival. We are in Film City, a 500-acre wonderland of fake mansions, poverty-stricken villages, schoolhouses, and police stations on the outskirts of Mumbai, where many of the big-budget Bollywood films are shot. Production costs for Indian films are a fraction of Hollywood budgets, though the use of megastars and elaborate sets is starting to narrow the gap. For *Veer-Zaara*, Yash and his 33-year-old son, Aditya, have re-created Yash's home state of Punjab, bringing in Sikh dancers from the villages, whose colorful turbans make them look like peacocks.

Yash's half-century filmmaking career has produced a string of box-office hits, and his film company, Yash Raj Films, is the most successful in Bollywood. These days, Yash and Aditya work

THE FILM NEVER MENTIONS POLITICS, SHOWS NO POVERTY, AND HAS NO WARS. THE GRIM SOCIAL REALITIES OF INDIA ARE SIMPLY NOT INGREDIENTS IN THE BOLLYWOOD FORMULA.

Russians sang along; the Uzbeks, Pakistanis, and Greeks sang along. What made these films so universally appealing?

To find out, I recently followed a Bollywood film called *Veer-Zaara*—which was released last November—as it was being made. In the movie, a Pakistani girl named Zaara (played by Bollywood megastar Preity Zinta) travels to India and falls in love with Veer, an Indian Air Force pilot (played by Shah Rukh Khan). But she has already been promised by her father to a man she doesn't love. It's a classic Indian love story that takes improbable twists and turns. And the story of its making tells an equally classic Bollywood tale—the quest of one filmmaker, one of many in Bollywood who trace their roots to the partition of India and Pakistan, as he tries to heal the rift between the country of his residence and the country of his birth.

A movie set outside Mumbai. It's after midnight on a sweltering June night. A balding man booms commands into a microphone. The camera zooms in on a group of dancers as they swirl around a huge bonfire in front of a temple adorned with tinsel and fairy lights. A song slowly starts. . . .

Veteran film director Yash Chopra, an amiable man of 72, is directing a scene in which Veer is taking Zaara to meet his relatives in his village

in sync: Aditya writes the story, Yash directs it. On the sets Yash sits in front, issuing orders; Aditya watches from behind a monitor.

Aditya says he wrote the story of *Veer-Zaara* as a vehicle for his father to return to his Punjabi roots. Born in Lahore, in what is now Pakistan, Yash moved with his family to the Punjabi city of Jullundur when he was a boy. He came to Bombay in 1951 to work with his older brother in the film business. After decades in the city, Yash still prefers Punjabi food and speaks with a thick Punjabi accent. He is a rustic man in a glamorous world.

The secret to Bollywood's worldwide appeal, says Yash, is that its films are "wholesome"—his favorite word. The Indian government has given him four national awards in the category of "Best Film for Providing Popular and Wholesome Entertainment." He won't allow kissing in his movies. "If a boy loves a girl in India," he says, "they feel shy of kissing in public." In most Bollywood films, if two lovers want to thwart an arranged marriage, they can't just elope; they have to win over the disapproving parents. In *Veer-Zaara*, the hero and heroine never even touch each other, except in a fantasy song sequence.

During the 1960s and '70s, Yash introduced many elements now considered staples of the Bollywood film: romantic plots, lavish costumes

and sets, catchy songs sung in exotic locales. “In Hollywood they call these films musicals,” he says. “Here, every film is a musical.” He has shot multiple scenes in the Alps, transporting generations of celluloid lovers to frolic in the Interlaken—a substitute for predominantly Muslim Kashmir, which is the Indian idea of a honeymoon paradise but where filming would be too risky because of the continuing conflict

Yash on the set is Amitabh Bachchan, the actor who is playing Veer’s uncle. A larger-than-life figure in Bollywood for decades, Amitabh was ranked the “greatest star of stage or screen” in a BBC online vote in 1999, winning out over Chaplin, Olivier, and Brando. He is sitting on four plastic chairs stacked on top of each other, their arms bound by packing tape, because he needs a high chair to keep his long legs



that has riven the region since partition.

Yash has just come back from a scouting trip in Switzerland, where, he boasts, he didn’t spend a single franc because the Swiss government hosted him. “Everything on the house,” he says with the glee of a producer who’s spent his life making budgets stretch. The Swiss have given him an award for the contribution his films have made to tourism, and a lake where he often shoots is known as Chopra Lake.

Now in Mumbai a crew of hundreds is working through the night to complete the scene in which Veer brings his sweetheart home. Next to

STAYING FOCUSED *In the village of Sangola southeast of Mumbai, Jaban Abdul Mulani runs a projector at Ashok Touring Talkies. With rural crowds lured away by television and DVDs, this former traveling tent theater now stays put.*

comfortable. When Amitabh gets up to dance with the others, it seems slightly undignified, this icon of the cinema—and hero of my childhood—having to perform MTV-inspired dances at the age of 63. The moves seem slightly stale to me: The dancers throw their arms about, twirl, throw out their arms again. But when Amitabh

OPEN SEATING Under a tattered tent in Sangola, an all-male audience—common in rural areas—watches intently. Big-city viewers are livelier, says film scholar Manjunath Pendakur. “They cheer, boo, get into fights, even get on stage and dance.” Part of the appeal: Devoid of overt sex, Bollywood films exude a subtle eroticism, especially in “wet sari” scenes.





comes back to his improvised throne and watches the replay of the song on a monitor, he's clearly pleased. "We are too much," he says, laughing. "We are unbelievable!"

While the dancers take a break, Yash and Aditya fill me in on the rest of the movie: Veer crosses the border to Pakistan to be with Zaara and is thrown into jail as a suspected Indian spy. Zaara's fiancé convinces Veer that revealing his

Mumbai. A film crew has just finished decorating a fake courtroom with a Pakistani flag and the portrait of Jinnah, the first leader of Pakistan. The camera pans a row of spectators wearing traditional Pakistani clothes as Veer enters from the left. A song slowly starts. . . .

Bollywood films have been banned from theaters in Pakistan since 1965. Relations between the two countries have been difficult ever since



liaison with Zaara would besmirch her honor, and so Veer remains in jail for 22 years, never seeing his love. Toward the end of the film, a female Pakistani human rights lawyer, moved by Veer's plight, goes to court to free him. At the trial her case seems doomed by Veer's refusal to name Zaara to avoid dishonoring her.

"What happens next?" I ask.

"In a film of three hours," says Yash, "you either bring the lovers back together—or kill them. The audience should leave with tears or a smile."

So which will it be for Veer and Zaara?

GUARDING A LEGEND Fame follows revered actor Amitabh Bachchan, 63 (above), who travels with bodyguards for protection. Until a recent crackdown, the criminal underworld frequently bankrolled films—and extorted actors to star in them.

partition, and, despite overtures toward peace in the past two years, tensions remain so high that Pakistani officials refused to let the Chopras film in their country. So a playwright has been flown in from Lahore to advise the filmmakers on how to re-create a Pakistani courtroom in Film City.

The 1947 partition of the subcontinent into Muslim-majority Pakistan and Hindu-majority India prompted what is believed to be the greatest migration in recorded history, as perhaps 15 million people crossed the borders in both directions: Muslims streaming into Pakistan, Hindus and Sikhs fleeing to India. Yash was in his final year of high school when partition occurred. Suddenly his birthplace, Lahore, was in another country as the Punjab region was divided between India and Pakistan. The Chopras lived close to the new border, next to the Jullundur railway station, where Yash witnessed enormous bloodshed. Entire trains full of Muslims were massacred by Hindus and Sikhs—a mirror image of the carnage taking place in Pakistan. Estimates of the number killed

scene shooting is over for the day, I ride home with him in his BMW. An insomniac, he seems desperate for company and entertains me with stories until three in the morning. He is the funniest man I have ever met. He does imitations of scriptwriters proposing outlandish plots and journalists questioning his sexual orientation. He tells me about the time he was visiting a village in Malaysia. In the afternoon heat, he took a nap by the side of a road and had the sensation of being watched. When he woke up, he opened his eyes to see 60 villagers staring at him intently. A chant went up as they did their best to pronounce his name: “Chalukkhan, Chalukkhan . . .” Giggling, they led him by the hand inside a house. And then he saw it—a small shrine to him, with pictures and incense.

GANGSTERS TERRORIZED RECALCITRANT MEMBERS OF THE FILM INDUSTRY, ATTEMPTING TO KILL ONE DIRECTOR AND ISSUING DEATH THREATS TO SEVERAL ACTORS.

range from 200,000 to a million. Yash could hear the screams of people as they were burned and stabbed. “I got very affected by partition,” he says.

Like Jews in the founding period of Hollywood, many of Bollywood’s early filmmakers were refugees. Some, like Yash’s brother, had worked in Lahore’s film industry before partition. Others gravitated to the industry after they arrived in Mumbai and found it difficult to break into more traditional Indian industries like textiles and shipping.

After years of making fluffy films about yuppies in Mumbai, Yash says he is making this film as an attempt to heal the wound of partition—through a love story that gives the enemy a human face. His determination grows out of his religious beliefs as a Hindu. He says he prays every day, but abhors the way religion has led to violence between India and Pakistan—and around the world. Yash, whose wife is Sikh, says he prays with the same respect whether in a Hindu temple, a Sikh gurdwara, a Muslim mosque, or a Christian church. “In the name of religion, maximum bloodshed has happened in the world. And it didn’t stop in ’47. Every day it happens in Gujarat, in Kashmir, and in Pakistan between Shiites and Sunni.”

Shah Rukh Khan’s father’s family is also from Pakistan, and he is Muslim. After the courtroom

The 39-year-old has made 49 movies since he began acting in Hindi films at the age of 26. Top stars like Shah Rukh reportedly earn over a million dollars a film. His mansion, overlooking the sea in a posh part of Mumbai, has its own theater, but he’s watched only one movie in it. “I don’t watch Hindi films,” he says, taking a drag on a cigarette. “Too long. They go on and on.” I remark that he’s done well for himself in Bollywood and ask if he’s ever faced any prejudice because he’s Muslim. “The Hindu-Muslim partition never happened in the Indian film industry,” he says. “It is completely secular—it welcomes everybody with open arms.” Though Muslims make up only 12 percent of India’s population, three of the five biggest male stars have the same Muslim last name, Khan—Shah Rukh, Aamir, and Salman. “It’s so strange that in a Hindu nation like India they think of me as God,” Shah Rukh says. “Muslims just rock in the film industry.”

Indeed, some of Bollywood’s most successful songs have been written by renowned Urdu poets—predominantly Muslims who speak a language similar to Hindi—who came to Bombay from northern India to work in the movies, much as Faulkner and Fitzgerald once struck out for Hollywood. Javed Siddiqui, who comes from a long line of Urdu writers, has written scripts for over 80 films. He says the ideal Hindi screenplay

is a synthesis of Romeo and Juliet, "Laila Majnu" (the great Persian love story that traveled with Arab traders to India), and the Hindu epics of the Ramayana and the Mahabharata. In other words, a synthesis of Hindu and Islamic and Christian narratives—like India itself.

The Chopras stress that *Veer-Zaara* follows in that tradition. It is a love story between an Indian and a Pakistani that never mentions the politics of the India-Pakistan relationship, makes only passing references to religion, shows no poverty, and has no wars or even fistfights. The grim social realities of India are simply not ingredients in the Bollywood formula. But, says Aditya, "If we are successful in really pulling this film off, it could go a long way towards peace."

The Punjab. The wind blows softly through mustard and wheat fields. A film crew is tramping through the fields. Suddenly they see an isolated cluster of brick houses covered in a mixture of mud, dung, and straw. A song slowly starts. . . .

Aditya Chopra is looking for the idyllic Punjabi village, the perfect outdoor backdrop for the scene in Veer's home village. The only problem: Most Punjabis don't live in clay houses anymore. When we finally stumble across the cluster of mud and straw houses, we know we have found "it." Aditya listens with pleasure to the rhythmic sound of a water pump sucking water from the earth.

Aditya speaks with a slight stutter, but he is articulate about what makes a film work. Since he was a child, he has never wanted to do anything but follow in his father's footsteps. For years he kept a journal of every movie he saw, studying the films of directors in and out of India. Today, while most Bollywood directors live in the limelight, he is a virtual recluse—he has rarely been photographed and doesn't go to parties. He says he wants to be able to go to the theaters and watch movies without being recognized—to gauge the audiences' reactions.

Aditya was just a teenager when his father



CALLING THE SHOTS Preity gets in place (above) as venerable filmmaker Yash Chopra directs the action on location in the Punjab for the movie *Veer-Zaara*. Yash, with choreographer Saroj Khan (facing page, in white) plans a scene using 50 Punjabi dancers at Film City, a vast Mumbai studio complex. Running three hours or more, Bollywood films mix extravagant MTV-style musical numbers with plots rich in intrigue—and romance.



experienced a series of flops during the 1980s, considered to be Bollywood's dark period. As television and videos lured people away from theaters, filmmakers like Yash were producing hackneyed action and gangster films and seemed unsure of how to bring the audience back. At the age of 23, Aditya stepped in to turn the Chopras' fortunes around—bringing a more modern sensibility to the Bollywood formula. In 1995 he wrote and directed his first film, *Dilwale Dulhania Le Jayenge* (*The Brave Heart Will Take the Bride*), which also starred Shah Rukh Khan. *DDLJ*, as the film is shorthanded, was about Indian expatriates in London who get drunk, wear leather jackets and jeans, flirt and hold hands, but in the end travel back to Punjab and stay true to Hindustani values. With its easy mixture of

old and new India, the film soothed the insecurities many Indians felt in the mid-nineties, when economic reforms ushered in satellite television along with Coca-Cola and Levis. The movie suggested it was possible to remain true to Indian culture while embracing globalization. It became the longest-running Bollywood film of the time and inspired many imitators.

Along with this wave of more modern Bollywood films, a new era of professionalism began taking shape in the business. In 2000 India finally recognized Bollywood as an official industry, paving the way for banks to finance films. Previously producers had often turned to the underworld for funding. The result: Dons extorted stars to act in their films and terrorized recalcitrant members of the industry, attempting

AFTER YEARS OF MAKING FILMS ABOUT YUPPIES IN MUMBAI, YASH SAYS HE IS MAKING THIS FILM AS AN ATTEMPT TO HEAL THE WOUND OF PARTITION.





DARING SUITOR Arms outstretched above a crowd of spectators, Shah Rukh serenades Preity. As in all Bollywood films, he lip-syncs his song. Actual lyrics are recorded by studio "playback singers," who often become musical stars in their own right. Well before a Bollywood film hits the screen, its soundtrack hits the airwaves, part of a pre-release blitz to build an audience for coming attractions.



to kill one director and issuing death threats to several actors and producers. At the turn of the century several producers were jailed for concealing the underworld's involvement in financing their films, and top actors were called upon to testify. Preity Zinta was one of the few who cooperated with prosecutors and spoke out about the extortion calls she'd received from gangsters. Newspapers called her "the only man in the film

costume themselves in chiffon saris, and perform dances at their weddings—an act unthinkable in much of India, where women who dance in public are considered immoral.

But as films began catering to urban and overseas audiences, film attendance in rural India declined. "They're sick of watching rich people in London," Aditya says. The surprise result of last year's general election, which the



world." Today the underworld's influence has lessened considerably.

The newer Bollywood films are aimed at India's urban consumers and the overseas market—some 20 million Indian expatriates around the world—who love Hindi films even after they have forgotten Hindi. "They don't come back here—they think the water is dirty," says Yash Raj CEO Sanjeev Kohli. "So their children's only connection with India is Hindi films. Hindi film is India for them." Bollywood has even changed the wedding rituals of overseas Indians. Young brides in the India diaspora now hire choreographers,

SEDUCTIVE ICONS Amitabh and a tattered Shah Rukh frame former Miss World Aishwarya Rai. Such posters lure India's star-obsessed populace into the movies' fantasy realm, where true love and justice always prevail.

Congress Party won mostly thanks to the rural vote, has served to remind everyone that India is still very much a nation of villagers. "It's a challenge to make a film for both the viewer in the Loews Cineplex and the one in the village theater with a noisy fan." But that's what he's trying to do with *Veer-Zaara*. He's betting that the

overseas Indian audience is just as hungry for a portrayal of village India. So he is giving them the rural idyll they wish they'd grown up in before they moved to New York or London.

Aditya understands the universal appeal of the themes the Pakistani refugees brought with them a generation ago: the loss of home, the breakup of family, and starting a new life from scratch on the streets of the intensely competitive metropolis of Mumbai. The famed actor Amitabh Bachchan sees a comparison with filmmakers in Hollywood. "Why does a Jewish director make a film about concentration camps?" For the same reasons the Mumbai filmmakers, the refugees and their descendants from Punjab and Sindh, are now making movies about the long-festered wound that is partition,

the 1977 coup carried out by Gen. Zia-ul-Haq.

Even in ostensibly secular India, right-wing Hindu parties have pressured filmmakers not to hire Pakistani actors. Shravan Shroff, a leading distributor in Mumbai, would like to open multiplexes in Pakistan if the government allowed it, "but I don't want to come back to Mumbai and find mobs outside my home screaming, 'You have let the country and your religion down!'"

Forbidden love, it turns out, is a good metaphor for the relationship between India and Pakistan. Despite periodic thaws in relations between their governments, the two peoples can only love each other in someone else's house—in the United States, in England. *Veer-Zaara* perfectly captures the sentiment, widely shared among people on both sides of the border: They love

"EVERY HINDI FILM HAS AN IMPOSSIBLE DREAM, BUT YOU LIKE TO BELIEVE THAT IT'S POSSIBLE. . . . THAT YOU CAN GO TO A TEMPLE AND IF YOU'RE BLIND, YOU'LL GET YOUR EYES BACK."

and their lost homeland of Pakistan. "The smell of the soil is going to remain with you," he says.

Lahore, Pakistan. A video shop just 15 miles from the Indian border. A man in Western dress is scanning the rows of Bollywood movies, searching for something he cannot find. A song slowly starts. . . .

The soil smells exactly the same in the enemy country, soft and moist with the new rain. I have traveled over the border to Pakistan, the country in which *Veer-Zaara* is partly set, but where its screening is forbidden. The video shop has pirated copies of all the latest Bollywood films—part of a trend of unlawful copying and distribution that the Indian film industry estimates cost it more than 60 percent of total revenues.

Despite the ban on Indian films in Pakistani theaters, "everybody watches them," says Asif Aziz, the shop's manager. This poses a quandary for the country. "We in Pakistan don't know whether to go forward or back. Islam pulls us backward, and Indian movies pull us the other way. We don't know which way to go."

I ask if he has any films made here in Lahore, in what has come to be called Lollywood. "We may have one . . ." he says uncertainly. Pakistan produced over a hundred films a year in the 1970s but now is down to about 40. Its movie industry withered under Islamization following

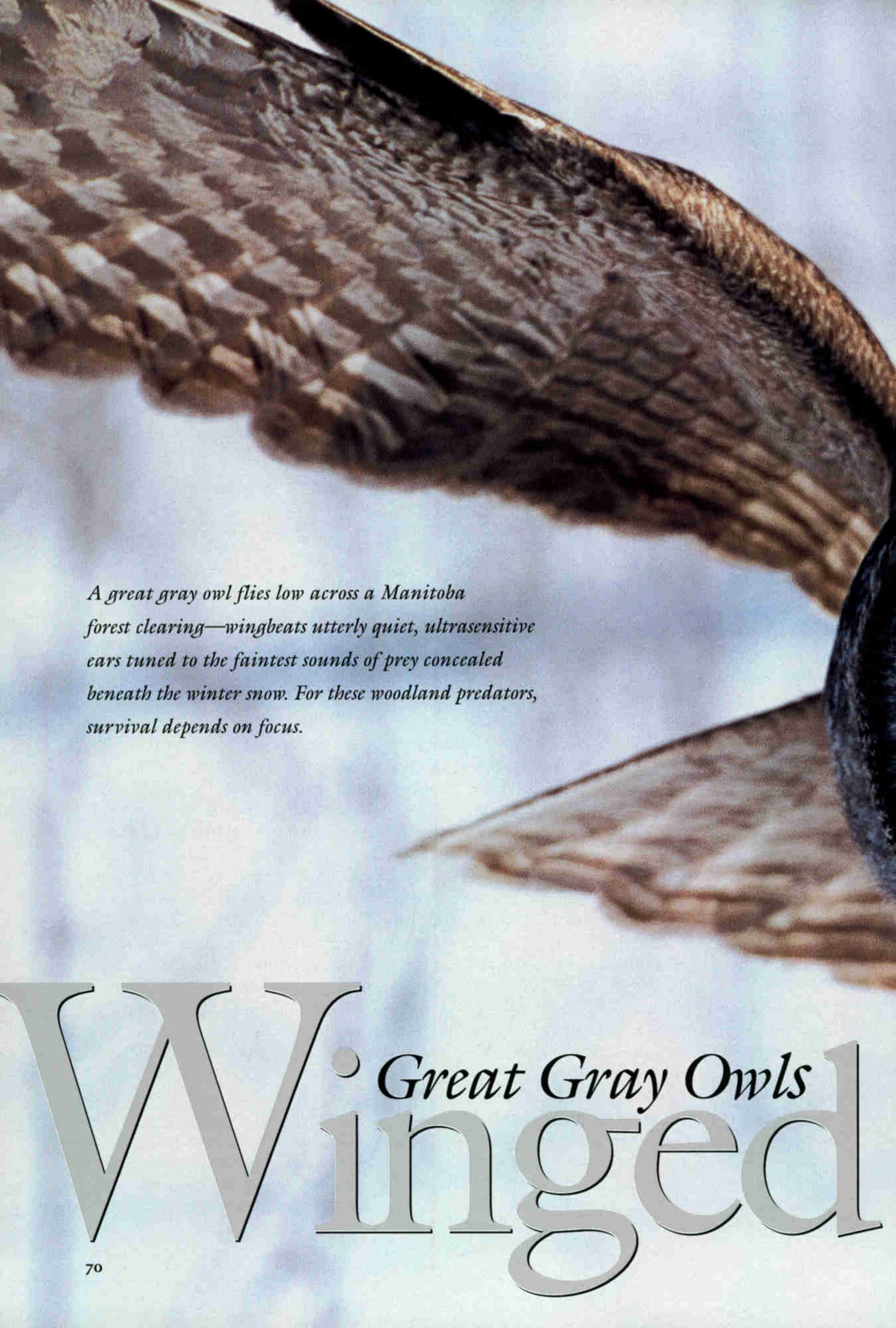
one another, yet are doomed to love tragically.

But not quite. Because, Yash says, "I don't like tragedies." In his film the Pakistani lawyer finally goes to India to find proof of Veer's identity so he can be freed from jail. And it is in Veer's village that she discovers the shocker: Zaara thought that Veer was dead, so she divorced the husband she'd been forced to marry, crossed the border to India, and has spent the past 22 years caring for Veer's relatives and fulfilling his dream of establishing a girls' school in his village. She has been as true to love as Veer has been.

A man spends 22 years in jail to protect the honor of a girl he's known for only two days. Is this believable? I ask Aditya.

"Every Hindi film has an impossible dream, but you like to believe that it's possible," he says. "You like to believe that you can go to a temple, and if you're blind, you'll get your eyes back." So the last line of the script is: "Veer and Zaara back at the village live happily ever after." And the audience—in Lucknow and Lahore, in London and Lima—can walk out with tears, and a smile. □

BOLLYWOOD BECKONS Thrill to scenes from *Veer-Zaara*, sway to its soundtrack, witness photographer Bill Allard's journey through India's film world, then join our forum: What is the attraction of Bollywood? Could this film really help heal Indo-Pak relations? nationalgeographic.com/magazine/0502.



A great gray owl flies low across a Manitoba forest clearing—wingbeats utterly quiet, ultrasensitive ears tuned to the faintest sounds of prey concealed beneath the winter snow. For these woodland predators, survival depends on focus.

Winged

Great Gray Owls



Silence

By LYNNE WARREN NATIONAL GEOGRAPHIC WRITER

Photographs by DANIEL J. COX



With the remains of a spring snowstorm whitening the Montana woods—and making chipmunk an easy-to-spot entrée—a great gray male (left) delivers food to the broken-off tree where his mate and chicks wait. After shredding the flesh, the female drops a morsel into an owlet's gaping mouth (right). Great grays in the lower 48 eat a variety of small rodents, including voles and gophers, but populations in Canada and Alaska prey almost exclusively on voles.



These owls don't just pounce, they plunge. With ice-pick talons tucked under their chins, great grays hurtle headfirst into deep snow to snatch voles—diving with such power that they can shatter snow crust thick enough to hold a 180-pound person. They locate hidden prey with the help of large facial disks that funnel sound to their ears. When the plunge succeeds, as it did for this Manitoba owl, the hunter wriggles out of the snow (below) then carries the prey (right) to a safe spot for eating. This hunting technique gives great grays an advantage over other predatory birds, many of which must migrate to areas where lighter snows leave prey more accessible.





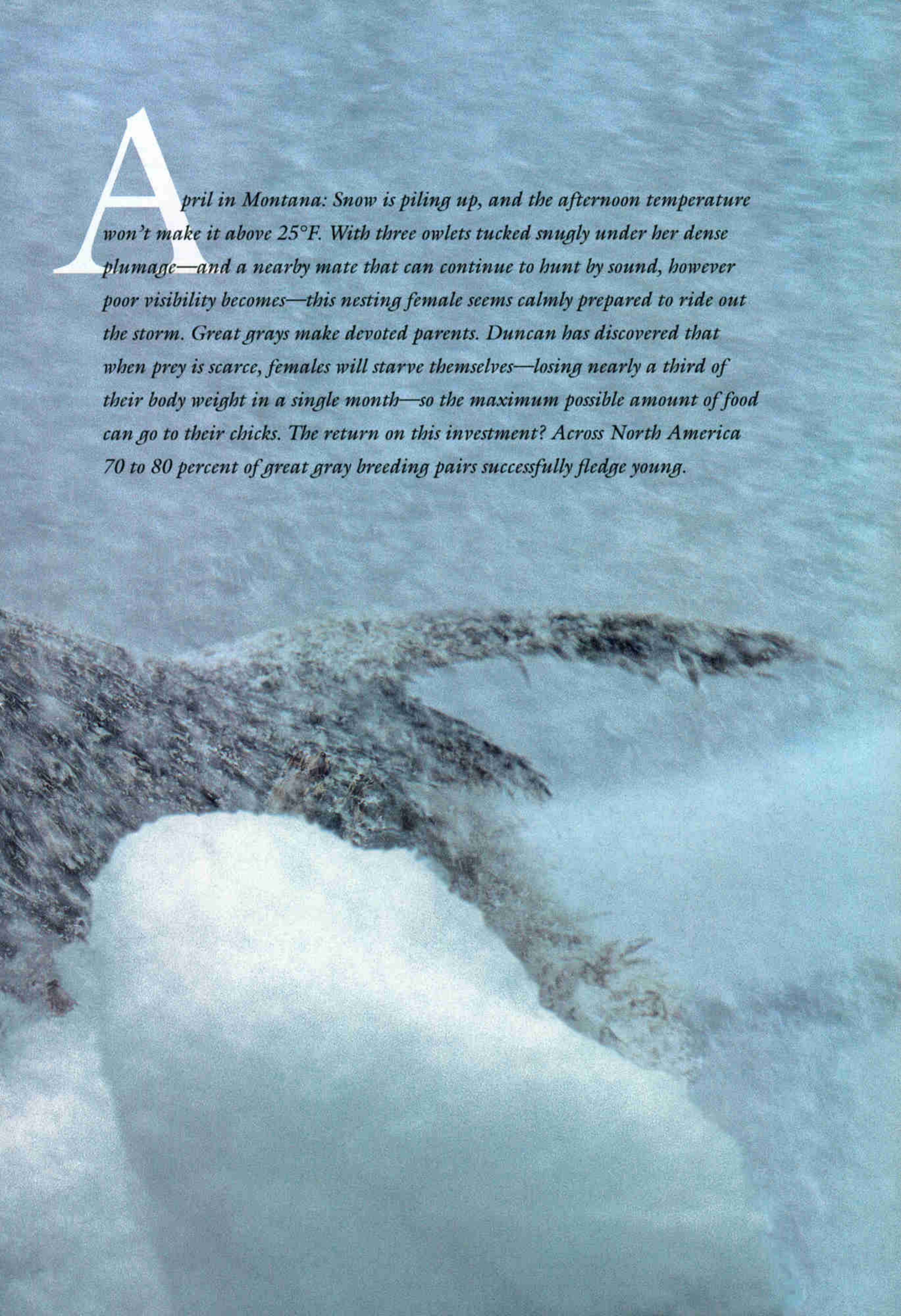
In winter adult great grays consume up to a third of their weight in rodents daily. Females in particular pack on reserves to sustain them through more competitive summer months. "It's as if there's a big winter sale on voles, and great gray owls are the only customers in the store," says Canadian conservation biologist Jim Duncan.

Researchers estimate that 20,000 to 100,000 great grays live in Canada and the U.S., with similar numbers in Europe and Asia. In North America, Duncan and his colleagues have found that northern populations of great grays are highly nomadic, flying hundreds of miles as vole numbers boom and crash in different areas.

By contrast, studies in Oregon and California have shown that more southerly populations, which have more diverse diets, tend to stay put, often occupying home ranges smaller than five miles across.





A Great Gray Owl is perched on a snow-laden branch in a winter forest. The owl's feathers are a mix of brown, gray, and white, providing excellent camouflage against the snowy background. Its large, round eyes are visible, and it appears to be looking towards the camera. The surrounding environment is filled with snow-covered trees and branches, creating a serene and cold atmosphere.

April in Montana: Snow is piling up, and the afternoon temperature won't make it above 25°F. With three owlets tucked snugly under her dense plumage—and a nearby mate that can continue to hunt by sound, however poor visibility becomes—this nesting female seems calmly prepared to ride out the storm. Great grays make devoted parents. Duncan has discovered that when prey is scarce, females will starve themselves—losing nearly a third of their body weight in a single month—so the maximum possible amount of food can go to their chicks. The return on this investment? Across North America 70 to 80 percent of great gray breeding pairs successfully fledge young.





Just big enough for mother and chicks, this 18-foot-tall Montana snag offers a commanding view of prime great gray habitat: mature forest with lots of flying room. Though adult great grays weigh only two to three pounds, they have wingspans 60 inches across and can be up to 33 inches high—by tape measure the tallest owls in North America. Their size makes it difficult for them to maneuver well in dense stands of trees. To hunt efficiently, they need meadows and other open spaces, often created by fire, wind, disease, or careful timber harvests.

Fluffy and feisty less than a month out of their shells (below), chicks don't stay nestbound long. As wastes accumulate, the area around the nest develops a smell that makes its location dangerously obvious to predators. So for safety's sake, chicks need to disperse even before they can fly; most owlets climb or tumble to the ground (right) when they're just three to four weeks old. Parents continue to feed and defend their brood through the summer. One in three great gray chicks is killed—by ravens, great horned owls, weasels, or other predators—or starves to death when its parents can't find enough prey to keep the family alive. Two-thirds survive until they're able to fly at seven to eight weeks old.









“You’re looking at a very aggressive bird,” says Jim Duncan. When a great gray flares its facial feathers to expose the full length of its dagger-sharp beak, “it’s like a snarling dog showing his fangs.” From 30 feet away photographer Dan Cox used a remotely operated camera to record this adult patrolling the Montana clearing where its chicks were hiding. Parents attack anything—bear, lynx, unwary hiker—that gets too close to their young. What does a wallop from a great gray feel like? “Like being whacked by a two-by-four with nails sticking out of it,” Duncan says.

CAMERA SHY Great grays are hard to spot in the wild, but you can download great-gray wallpaper at nationalgeographic.com/magazine/0502.



a photographer's story
by DANIEL J. COX



epilogue

When I first went looking for great gray owls in the Bridger Mountains near my home in Bozeman, Montana, I heard them *hoo-hooing* for days before I spotted one. Over several more summers I photographed what came to be a familiar group of birds hunting and raising young on the brushy slopes. A couple of seasons after I made this picture, I went back. The big trees were all gone, cut by a timber company. The owls were gone too; I didn't hear a single hoot. I know that natural and man-made disturbances open up vital hunting space for great grays. But along with good perches and plenty of rodents, these birds need big trees for nest sites. I was stunned, and sad. I wondered how far the owls had traveled to find new homes, and whether I'd ever see them on this mountain again. □

Consider yourself warned. You're



Can California's largest and most troubled lake be saved? A landmark water deal may do the trick—or leave it as dead as the flooded palms that skirt its shore.

By Joel K. Bourne, Jr.

NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by Gerd Ludwig

about to visit California's
sometimes lethal,
oft maligned, oddly beautiful,
and downright
weird

salton sea





the blooming desert

An armful of flowers adds a touch of color to a billion-dollar farm economy in the bone-dry Imperial Valley south of the Salton Sea. Diverted Colorado River water irrigates valley crops; the runoff then flows in to sustain the sea. A series of floods in 1905 created the sea when the river blew out an unprotected intake canal and poured into a depression called the Salton Sink. It took two years to force the river back into its former bed.



i

f I didn't know better, this would seem the perfect place to toss a beer can, bury nuclear waste, or hop in a big monster truck and drive wherever the hell I want. I am standing 227 feet below sea level on the desert shore of California's largest lake and this country's strangest backwater: the Salton Sea. It's prettier from afar, a broad blue lens lapping at the base of rust red mountains. Up close the beach, if you can call it that, isn't sand but layer upon layer of barnacles and bones from the millions of fish that have expired here in mass die-offs over the years. The blue water is an illusion as well, a reflection of the desert sky. The sea actually looks like dark beer, and carries more than a whiff of sulfuric decay. Gobs of foam line the shore. Stringy mats of algae float in it as if it were



some kid's science project gone horribly wrong. Just the place for a swim.

It will be a ceremonial swim for me, my penance as a former resident of San Diego, 85 miles west of here. I figure I owe the Salton Sea that much, since it's mostly my beloved beach town that's begun to suck the lake dry. In 2003 a historic water deal transferred a huge gulp of Colorado River water from the farms of the Imperial Valley, which feed the Salton Sea, to the sprawling office parks and developments of the old mission town. The acrimonious water deal reaffirmed an old saying in these parts: In the

West water flows uphill toward money. The transfer will cut inflows to the Salton Sea by 20 percent, water the shallow lake desperately needs to keep from shrinking into a hypersaline mud puddle, devoid of little more than microbial life.

So I will swim. But not here. Not now. When you go to dip your toe in the Salton Sea, it pays to be picky. I hop in my go-kart of a rental car, scratching gravel as I cruise past the withered palm trees of Salton City. I pass the Sidewinder Golf Course—no greens fees, no greens, just different grades of sand scraped together by enterprising retirees from a nearby RV park. A few older men are finishing up on the nearest hole, and they raise tanned arms to wave.

As I wave back, it hits me that the future of the Salton Sea hangs on two things: golf balls and pileworms. Golf balls, of course, being the target of that addictive game perfected by the Scots to torture retirees and line the pockets of real estate developers. Pileworms, of course, being the slimy strands of biomass no bigger than a golf tee that are the target of millions of fish and birds—some critically endangered—that have for decades viewed this giant stagnant pond as an all-you-can-eat buffet. Together, in the right mix, they could be the sea's salvation, creating a utopia where wildlife, fun-loving humans, and industrial agriculture peacefully coexist. But in this place of big schemes and broken dreams, I had to admit it was a long shot.

there would be no pileworms, no birds, and indeed no Salton Sea to worry about if it weren't for the Imperial Valley, a bone-dry desert the Spanish called the Valley of the Dead before developers tapped the Colorado River and turned it into an agricultural Eden. A hundred years ago spring floods blew out an intake canal just south of Yuma, Arizona, and in no time the entire Colorado River was cascading down the 400-foot elevation drop into its old on-again, off-again repository then known as the Salton Sink. It took two years to close the

beating the heat

With summer temperatures routinely in triple digits, locals will do anything to cool off. A worker (opposite) secures a bandanna to shield her face from the scorching sun. Residents of Slab City—a freewheeling RV community near Niland—opt for an illicit dip in Coachella Canal, one of the area's major irrigation arteries.



Could this one day be a utopia, where wildlife, humans, and industrial agriculture peacefully coexist?

breach, and by then a 500-square-mile freshwater lake covered the basin. Unlike previous incarnations that evaporated in the 115-degree summer heat, the new Salton Sea hung around, thanks to the runoff of salty, fertilizer- and pesticide-laden irrigation water from booming valley farms. The nearly half million acres of fields now grow much of the produce in the United States, earning it the nickname "winter salad bowl of the nation."

To those who wouldn't spend a dime to save the Salton Sea, who'd let "nature" take its ruthless course, I have two words: Owens Lake. By the mid 1920s, Los Angeles had drained the Sierra Nevada lake to fill the taps of its sprawling suburbs. Today the dry lake bed is the largest single source of particulate matter air pollution in the nation. In 1998 a local agency forced Los Angeles to begin controlling the fine dust blowing off the lake bed. The total cost of dust control on the worst 30 square miles has been estimated at 415 million dollars, plus another 26 million dollars a year to keep the lake bed damp enough to stay put.

The amount of water to be transferred from the Salton Sea is about the same as the amount taken from Owens Lake. But the potential exposure at the shallower sea could be triple the size. The Imperial Sand Dunes southeast of the sea—now an off-roaders' paradise—are testament to the area's strong winds. What's more, the sea's sediments contain heavy metals, pesticides, and salts, which act like a defoliant on field crops and golf courses alike. The sea's murky waters, which now cover 376 square miles, may serve a noble purpose after all: to keep the Imperial and Coachella Valleys from becoming the toxic Dust Bowl of the 21st century.

Water is a precious commodity, however, in a region with limited supply and growing demand. The Imperial Irrigation District expects to eventually pocket 50 million dollars a year for selling its water to San Diego. That's good for valley farmers since the money will go



Spirits fly at Imperial Sand Dunes, an off-roaders' haven blown from the dry bed of Lake Cahuilla, the Salton Sea's ancient ancestor. More than a million fans hit the dunes each year, pumping 54 million dollars into local coffers. The cost? Brawls, fatal crashes, and run-ins with endangered desert species.

to projects like canal lining and pump-back systems that will make farms more water efficient, but not so good for farm workers trying to put food on the table. Imperial County, which is 72 percent Hispanic, already has the highest unemployment rate and lowest per capita income in the state. The transfer could cost the county thousands of jobs as cropland is fallowed to send water to the cities.

Still, few would have cared about the fate of the sea if someone at California's Department of Fish and Game hadn't had the bright idea to



stock the newly formed lake with fish. With no outlet, excessive evaporation, and the Imperial Valley adding four million tons of salt a year, the lake was soon as salty as the Pacific Ocean. So fisheries biologists in the 1950s introduced ocean species such as sargo, bairdiella, and orange-mouth corvina—delicious sport fish that were as much fun to eat as they were to catch. The Atlantic pileworms? They were also introduced by the California Department of Fish and Game in the 1930s, from San Diego Bay, where they most likely had been dumped by ships releasing their ballast water. The pileworms thrived on the abundant algae in their strange new surroundings, and soon fishermen and fish-eating birds like pelicans, cormorants, and herons were flocking to the Salton Sea.

The 1950s and early 1960s were the heyday for the sea. Some years it boasted more than half a million visitors. Stars like Roy Rogers and Guy

Lombardo drifted down from Palm Springs to race speedboats, while fans partied and watched from yacht clubs. A young Sonny Bono learned to water-ski here, as did a million other kids. The real estate market was so hot that salesmen were taking people up in small planes and selling lots from the air.

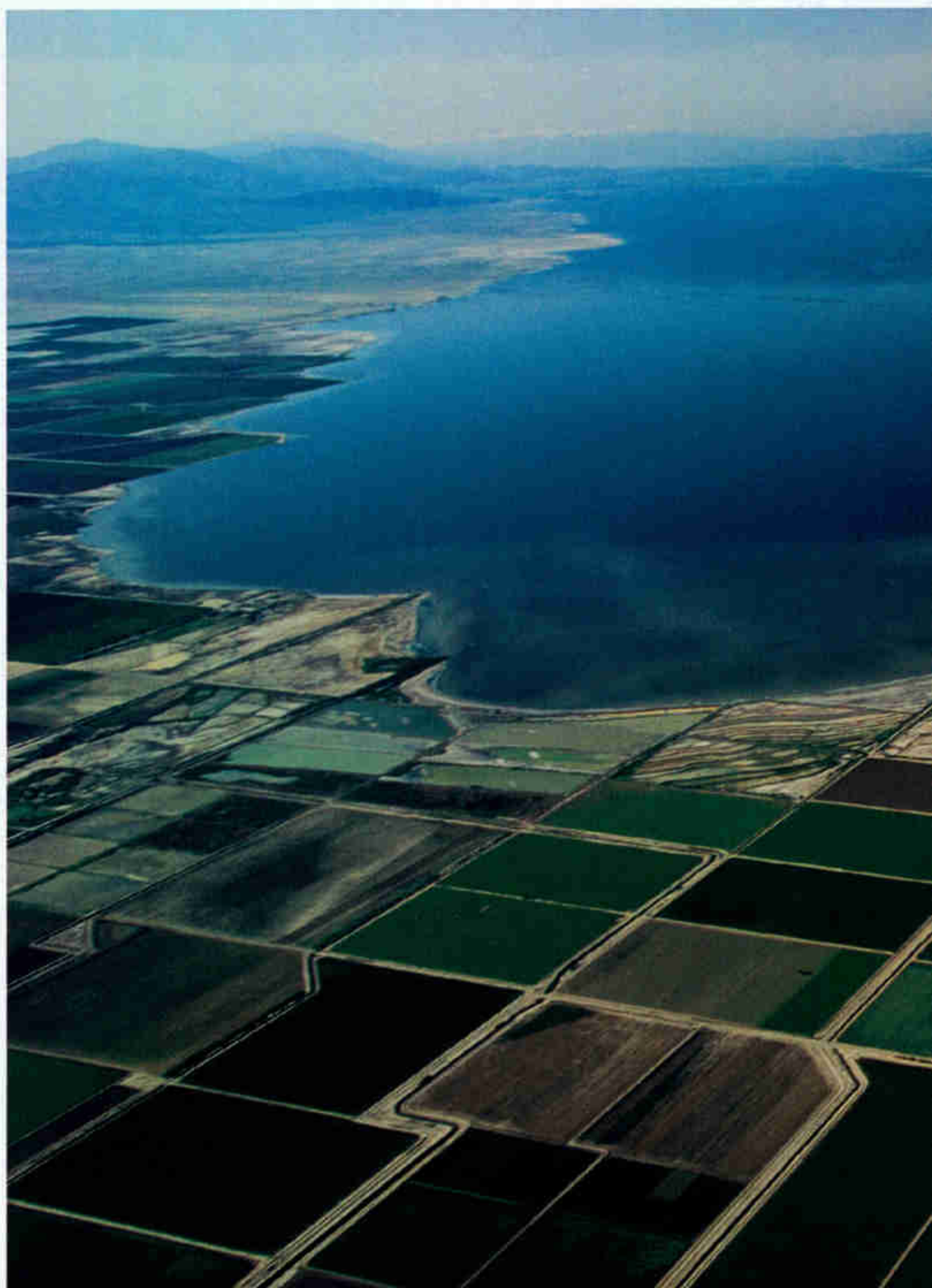
Bob Miller remembers the star-studded days of yore. As a boy he and his dad would take Lon Chaney, Jr., Hollywood's "master monster," fishing. "He liked to sit on the front of the pontoon boat and drag his feet in the water," says Miller, a tall, mustachioed cowboy who'd look perfectly at home in a Marlboro ad. "He had the biggest, gnarliest toes I've ever seen."

Dreams die fast and hard in the desert, and the Salton Riviera was no exception. The sea itself, with its fluctuating shoreline and creeping salinity, had by 1964 turned into a cruel mirage. Things only got worse in the 1970s. It's

follow the water



A victim of geography and hard-ball water politics, the Salton Sea lies 227 feet below sea level with no outlet—and very thirsty neighbors. Booming Coachella Valley (above) has 124 golf courses, and counting. To the south, the Imperial Valley's half million acres of fruits, vegetables, and feedlots (right) soak up more water than Los Angeles and Las Vegas combined. Salty, fertilizer-laden runoff feeds the sea, along with water from Mexicali carried by the New River, at center. A deal that diverts water to Coachella Valley and San Diego over the next 15 years will sharply cut inflows. The sea, now a haven for migratory birds, may become too salty to support current wildlife populations.







bordering on collapse

Killed by oxygen-depleted water, rotting tilapia carpet the sea in 1999, one of many die-offs that have decimated the sea's fish in recent years. Birds often share a similar fate. Avian botulism felled some 10,000 pelicans in 1996, bringing wide attention to the sea. Biologists now capture sick birds (below) for rehabilitation. A salt-covered car (opposite) shows another threat: Rising salinity may wipe out fish and the birds that eat them.



hard to sell waterfront lots when dead fish carpet the shore and rotting algal blooms raise a stench vile enough to keep people indoors miles away. The final blow came in 1986 when *60 Minutes* declared the New River—which brings in a third of the sea's inflows along with remnants of sewage from nearly a million residents of Mexicali—the most polluted river in the world.

it's dawn on a February morning, with snow frosting the Laguna Mountains to the west. Bob Miller and I are sipping coffee and riding in his battered truck along the south shore, near the national wildlife refuge named for Sonny Bono. The air, the water, the rustling reeds all tremble with feathered creatures of every shape and hue. Black-necked stilts probe the bottom for a pileworm breakfast beside blushing American avocets and rakish eared grebes with their cocky pompadours flung high. Ruddy ducks and cinnamon teal buzz by, while great blue herons lord over them all from the shallows.

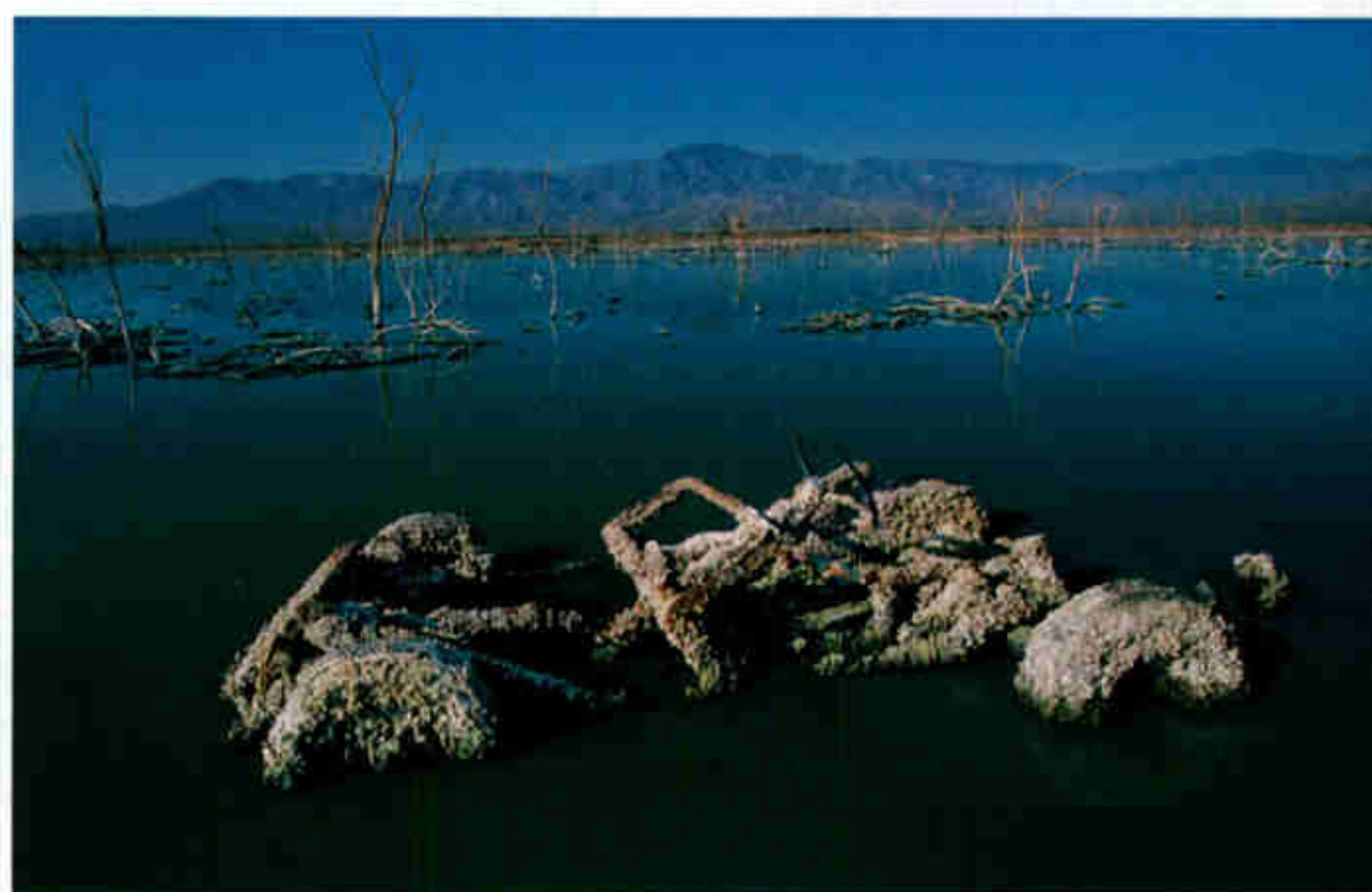
Miller reels off a dozen varieties of shorebirds and creamy white gulls and then without warning slams on the brakes, sending coffee flying. He leaps out the door, grabs a digital camera rigged to a spotting scope, and fires off a few frames of a yellow-footed gull—a bird that to my eyes looks identical to a hundred other gulls bobbing nearby, save for its banana-colored appendages. “Ya hoo!” he yells, as if he had just hopped off the winning bull at the rodeo. “That’s the best bird I’m going to see all day.”

Somehow this odd accidental lake, with its prolific fish and nearby fields, has become one of the most important migratory bird habitats in the U.S., if not the world. Millions of birds representing more than 400 species can be spotted here, including endangered brown pelicans and Yuma clapper rails. Snow and Ross’s geese arrive from the Arctic; blue-footed boobies cruise up from South America. Why? Perhaps because in southern California there’s no place else to go.

“Ninety percent of all wetlands in California are gone,” Miller says, shaking his head. “This is what’s left of the Pacific flyway.”

It’s not always the safest rest stop. More than 150,000 eared grebes perished here in 1992. The cause is still a mystery. The death of some 10,000 pelicans from avian botulism in 1996 brought national attention to the sea, along with some

“Ninety percent of all wetlands in California are gone. This is what’s left of the Pacific flyway.”



much needed federal money from Congressman Bono to see what, if anything, could be done to save it.

Even the most grandiose solution will rest heavily on the back of the lowly pileworm. Fish eat the worms, birds eat the worms and the fish, and when the fish die—sometimes by the millions—the worms get the last bite. Who would have guessed that a little red wiggler that swims to the surface and explodes to reproduce could be such an important species?

At the Salton Sea, it seems, anything is possible. Miller picks up a piece of pumice and hurls it into the water. The stone bobs in the salty waves. “Besides,” he says, “where else can you throw a rock in the water and it actually floats?”

The sea has more fans the farther north you go, though everyone seems to have a different reason for the attraction. Even in Bombay Beach, a hard-luck development on the east shore, hope stirs among the few hundred residents. Rising lake levels in the 1970s turned their lakefront into a flooded junkyard, with salt-encrusted trailers and cars slowly dissolving into the ooze. But in the cold dark recesses of the Ski Inn bar, retiree Barbara La Clair sees a silver lining.

“You’re out of the smog, out of the city,” she says. “It’s a nice place for retired people. It just grows on you.” La Clair started coming in the early 1960s, camping and fishing with her

the valley's future

All dolled up, Aileen Palomino heads to her aunt's *quinceañera*, a coming-of-age rite for Latina girls turning 15. Mexican Americans make up more than 70 percent of Imperial County, the state's poorest county. Many rely on agricultural jobs, which may shrink along with the sea.





“You’re out of the smog, out of the city. It’s a nice place for retired people. It just grows on you.”

husband and four daughters, and retired here in 1990. In the '60s, she recalls, Bombay Beach had five bars and five restaurants. Campers jammed the nearby state beach four rows deep, and you had to make reservations at the boat ramp.

“Does anyone swim in it anymore?”

“Yuck,” says Paulette, the bartender.

“I don’t even know how to swim,” confesses La Clair. About then a young couple walks in the bar, and La Clair’s face lights up. “You should talk to Bill and Thelma. They’re in it all the time.”

Bill and Thelma Leslie love the sea. They fish, ski, and just mess about in the water with their four kids every chance they get. “I never got sick from swimming in the sea,” says Bill, who has lived here for 27 of his 35 years. “I got strep throat from swimming in the [Coachella] canal once. But in the sea, never.”

“I tell the kids, keep your mouth shut tight,” says Thelma. “We just hose them down when they get out.” Bill works at a nearby fish farm and delivers fresh tilapia from tanks to the fish markets in San Diego and Los Angeles. These are the same variety of hardy freshwater African fish that somehow appeared in the lake in the 1970s and in a few short years took it over. Filter-feeding omnivores, tilapia thrived on the pileworms, plankton, and algae, while the bigger corvinas and fish-eating birds like pelicans, cormorants, and herons thrived on the tilapia. Moreover, some fishermen claimed they could catch a hundred of the tasty fish in an hour.

As recently as 1998 there were untold millions of fish in the Salton Sea. Then the fish started dying. In winter, cold snaps killed the tropical tilapia; in summer, desert winds churned up lethal deoxygenated water. An estimated 14 million fish turned belly up in 2000; 21 million in 2001. Despite the yard-long whopper of a corvina hanging over the bar at the Ski Inn, only a handful have been caught in over a year. Scientists believe the rising salinity, now more than 25 percent saltier than the Pacific Ocean, may

have contributed to reproductive failure in three of the four main species. The long-predicted death of the fishery may finally have arrived. But Bill Leslie, an avid fisherman, doesn’t buy it.

“Two years ago the fishing was unbelievable,” he says. “One year of no fish and everybody panics. But it’s a cycle. Next year will probably be a boom year. Two years ago we didn’t catch ’em all. They’ve got to still be out there.”

“The sea’s not dead,” he says, willing it to be so. “The sea’s not dead.”

He’s right. The pileworms are still there, miraculously enough. But at some point they too will perish like salt-doused slugs. After that, the only thing left for fishermen—or birds—to catch will be minuscule brine shrimp, microbes, and salt-loving bacteria.

it couldn’t be farther metaphorically from the rusted out trailers of Bombay Beach to the gated golf course communities of La Quinta, 45 miles north in the Coachella Valley. But that’s where at least some of the sea’s water will go—a payoff to the local irrigation district to allow the water deal with San Diego to proceed. Here golf courses, designed by the likes of Arnold Palmer and Jack Nicklaus, have multiplied like tilapia—124 at last count. Folks from Los Angeles to Seattle are retiring here in droves, lured by endless sun, active lifestyles, and, of course, golf.

That’s what Tom Kirk is counting on. A young land planner with a degree from Berkeley and the fine features of an actor, Kirk until recently headed up the Salton Sea Authority, a local government agency that includes Imperial and Riverside Counties, the Coachella and Imperial Valley irrigation districts, and the Torres-Martinez Indians, who happen to own some 10,000 acres currently submerged under the Salton Sea. With a paid staff of two and help from two scientists from the U.S. Geological Survey, Kirk had the impossible task of finding a way to save the sea while pleasing everybody. He considered and rejected a number of plans to reduce salinity, including connecting the sea via pipes to the Gulf of California, digging a canal to the Pacific, or desalinating the inflows from the Imperial Valley. All were discarded as too expensive or physically infeasible.

In his small offices in a quaint La Quinta shopping mall, Kirk spread a new map on the table



call of the snowbirds

All you need is a sand wedge—and a sharp eye for rattlers—to play the Sidewinder Golf Course in Salton City. The area's low costs and hot climes lure thousands of retirees. Katie Logemann, 97 (below, in red cap), attributes her longevity to the Fountain of Youth Spa near Niland, where she's lived since 1969: "A friend once asked me, 'What are you doing in this godforsaken country?' I said, 'Come join us!' He's been here ever since."





what a long strange trip

Leonard Knight made a pilgrimage to the Salton Sea two decades ago and has been painting God's praises on a small bluff ever since. Salvation Mountain, made of donated paint and adobe, has been called a folk-art masterpiece by some, a toxic dump by others. Ministers have asked to preach here, but Knight turns them down. "My mountain speaks good enough for itself," he says.



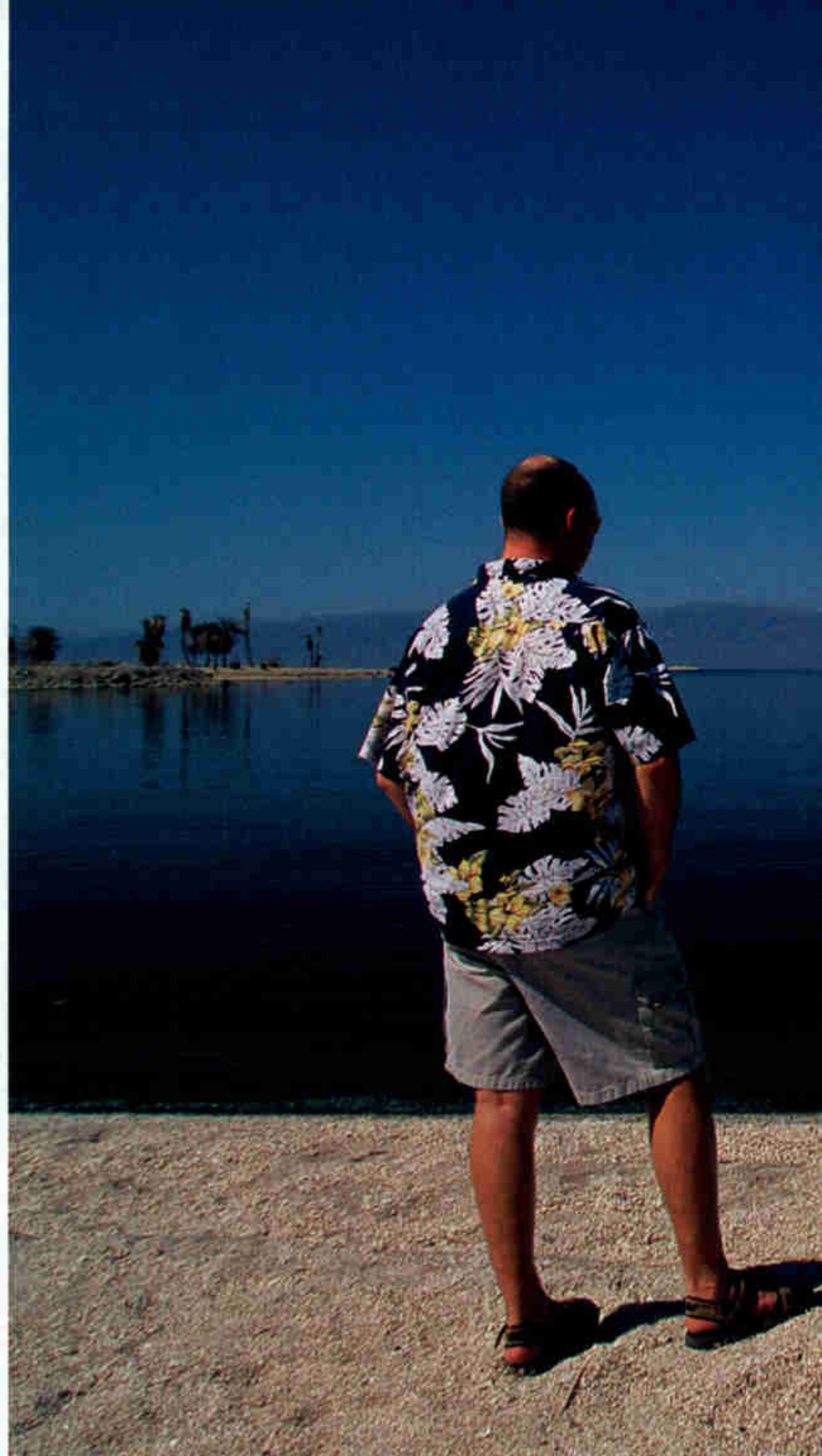
that contained his latest vision of what the Salton Sea could be. An eight-mile-long causeway bisects the lake at its narrowest point. To the north lies a deep blue lake roughly as salty as the Pacific, stocked with tilapia, corvina, and other marine fish. The old seaside developments of Salton City, North Shore, and Bombay Beach have blossomed back to life, replete with new marinas and even a lakeside casino owned by the Torres-Martinez. Each has a brand-new golf course. To the south of the dike, a series of wetlands and lakes are strung out like commas, providing pileworms and habitat for millions of birds, and cover to keep the dust from blowing. Large canals ring the east and west shores and provide inflows from Imperial Valley drain water and from the New and Alamo Rivers, cleansed of their impurities by man-made wetlands. Another set of canals provides the much needed outflow to keep the salinity in check, falling in stages to the evaporation pond. Farmers reclaim some land in the south and allow a booming geothermal electricity industry at that end to expand, helping ease California's energy crunch. The price tag for this dream: only 750 million dollars.

it's bold. It's audacious. It's absurdly optimistic, especially since California water officials—not Kirk or the authority—control some 300 million dollars carved from the water deal to mitigate whatever environmental damage it will cause. Not to mention the fact that you'd be building an earthen dam on sediments the consistency of peanut butter on top of the San Andreas Fault. Or the fact that southern California's thirsty population is growing as fast as a developing nation. None of this seems to bother Kirk.

"We're not restoring the Salton Sea," says Kirk. "We're re-creating the Salton Sea. We're creating habitat and recreation areas and trying to achieve multiple societal objectives with less water. It may be crazy boosterism, but I don't think we'll achieve environmental objectives without getting people excited about the economic potential. The cheapest land in southern California is around the Salton Sea. Boomers are retiring and looking for hot dry places to live. My motto is 'If you build it, they will come.'"

With more than 15 million sun-seeking people living within a three-hour drive of the sea, Kirk may just be crazy like a fox.

Later, along the shore, I rise at dawn and drive



Tourists view Salton City's flooded marina, a lure for movie stars in the 1960s. A state commission has until next year to decide on a restoration plan, or to leave the sea to its shrinking fate. Until then Californians will do what they do best: fight over the water.

to a state beach, a strip of campsites and bathhouses squeezed between the water and the Southern Pacific Railroad. A few campers are around, but the sea itself is deserted. I hike a short distance down a nature trail, waiting for the sun to warm things up but also procrastinating a bit. I know what I have to do, but I can't say I'm looking forward to it.

In summer the sea hits bathtub temperature, but in February it hovers in the 50s. Finally, with no more excuses, I pull on a wet suit and walk past a playground into a man-made lagoon dug out to allow boats to launch. I take one step into



the cold blackness and sink to my knees in the muck. Finally committing, I launch into the water, which smells like a thousand old pilings drying in the sun.

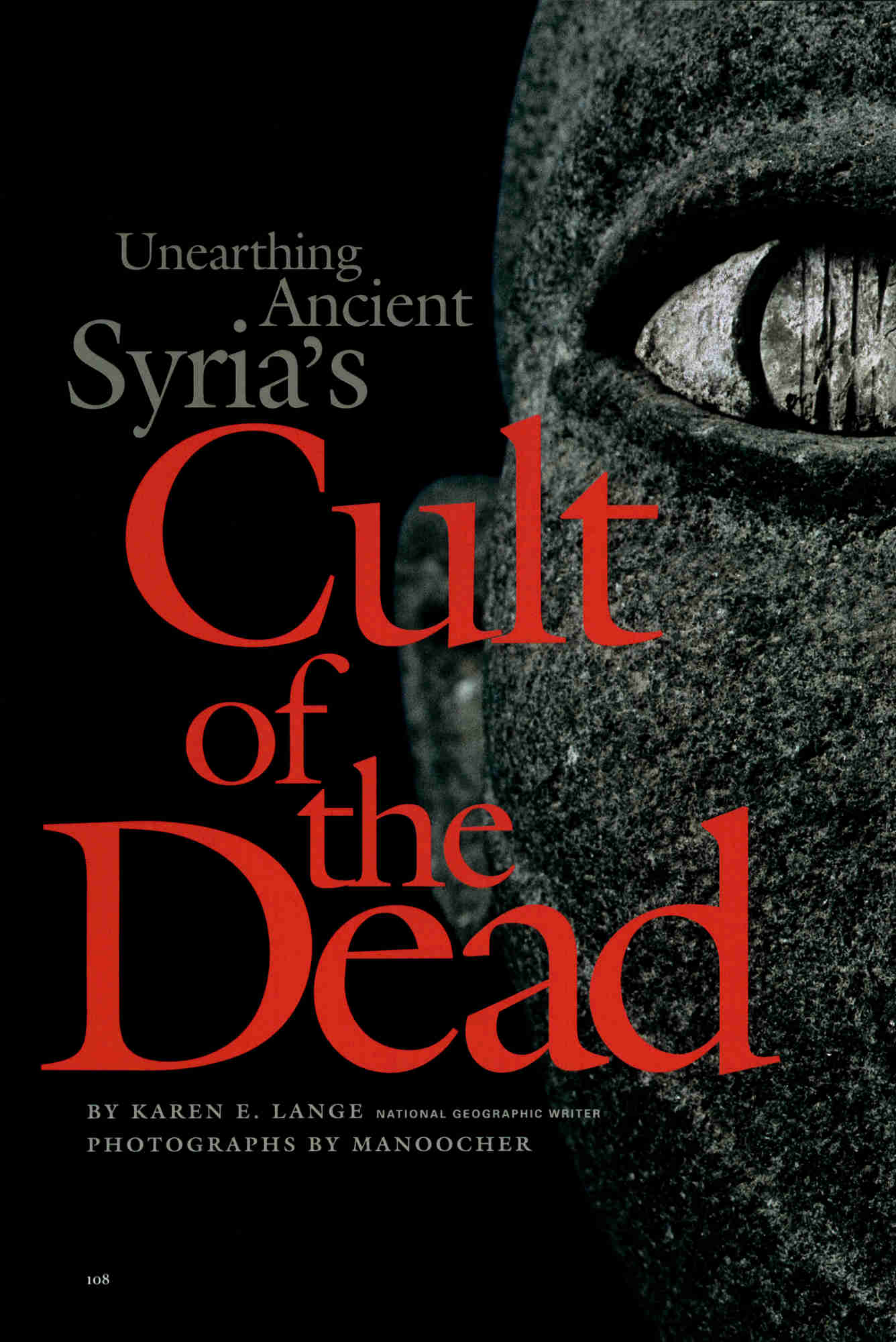
I try the breaststroke—my forte on the swim team those many years ago—only to learn that in hypersaline lakes, the parts of the body with greatest subcutaneous fat float higher than others. My butt is bobbing like a life preserver, so I switch to the sidestroke and make a mental note to start climbing stairs at the office.

I can swim out the channel into the open lake, but it seems wiser to climb out on the far side and walk over to the swimming beach. I reenter the water next to a grime-encrusted buoy. Barnacles crunch underfoot. I wade out about 50 yards and it's still only knee-deep, and I keep running into rocks with my shin. Algae shifts back and forth, oozing up in jellylike fronds. OK. That's enough absolution for one day.

The swim back across the lagoon is uneventful, even refreshing compared with the open lake. Perhaps the smell or some algal red tide is addling my brain, but I begin to see the possibilities. The rugged Santa Rosa Mountains climbing from the far shore don't look that different from the drier sides of Hawaii. There's a quiet, unbelievably sublime beauty amid all the muck. A vast, stable, healthy lake in the middle of the desert could be a recreational paradise. You just need a little imagination. And a lot of dough.

After climbing out, I find a coin-operated shower in the men's room. Just to be on the safe side, I stand under the steaming spray and scrub until I run out of quarters. □

CRASH LANDING What do you do when your paraglider engine fails over a populated area? Look for an empty spot. Learn more about photographer Gerd Ludwig's Salton Sea adventures at nationalgeographic.com/magazine/0502.

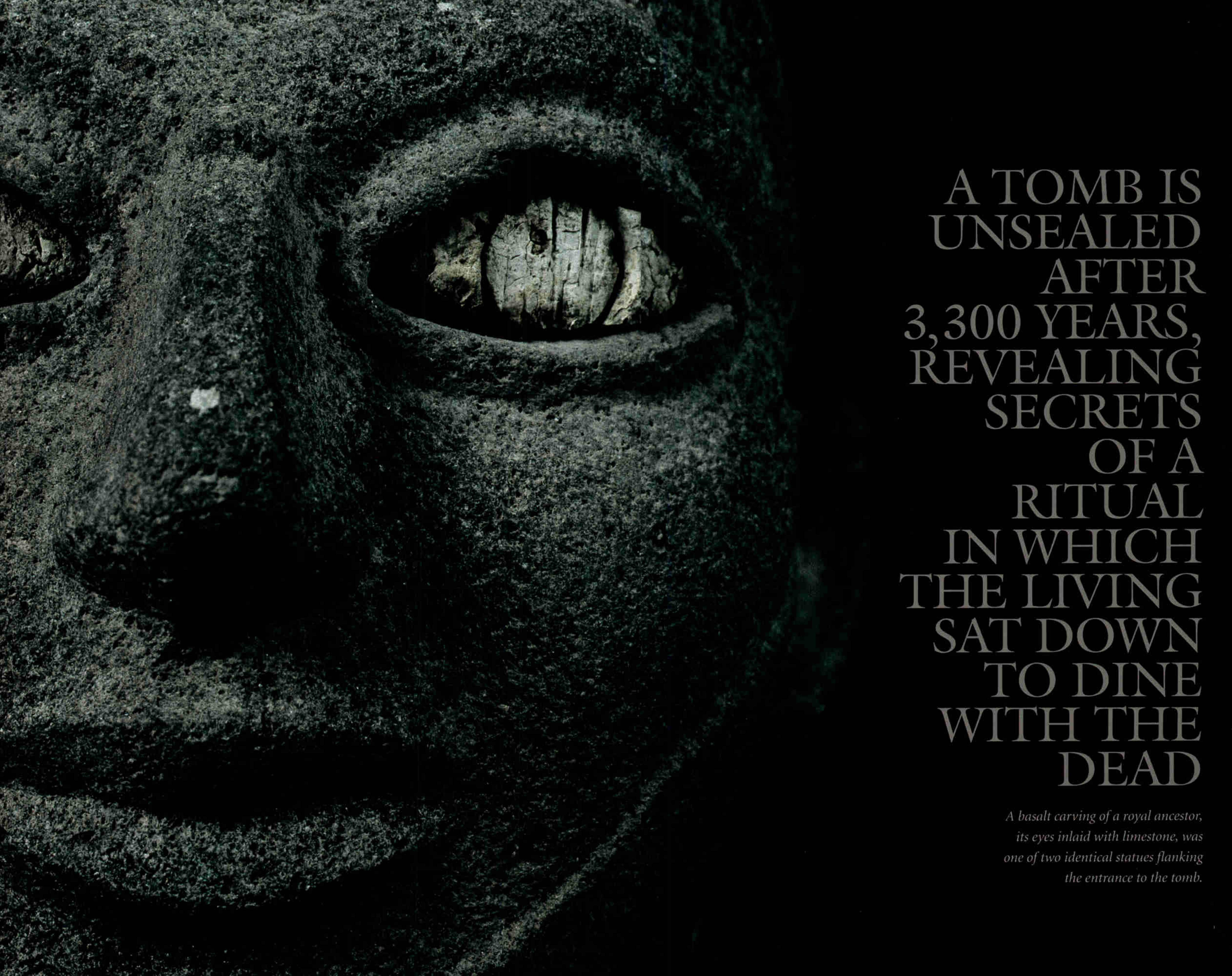


Unearthing
Ancient
Syria's

Cult of the Dead

BY KAREN E. LANGE NATIONAL GEOGRAPHIC WRITER

PHOTOGRAPHS BY MANOOCHER



A TOMB IS
UNSEALED
AFTER
3,300 YEARS,
REVEALING
SECRETS
OF A
RITUAL
IN WHICH
THE LIVING
SAT DOWN
TO DINE
WITH THE
DEAD

*A basalt carving of a royal ancestor,
its eyes inlaid with limestone, was
one of two identical statues flanking
the entrance to the tomb.*





King Idanda of Qatna faced imminent attack.

A great army—archers in chariots and foot soldiers with swords and axes—was marching toward his city in western Syria. For some 350 years a shrewd system of alliances had helped Qatna survive as a wealthy center of trade at a crossroads for donkey caravans. But now, circa 1340 B.C., small kingdoms like Qatna were being overrun by Hittites from the north, Hurrians from the nearby kingdom of Mitanni, and Egyptians from the south, all fighting for control of Syria. “Don’t be in despair! I will protect you!” promised a local king in a letter written to King Idanda. “Strengthen the city of Qatna until I will come!” encouraged another ally.

In response, King Idanda told his generals to fortify Qatna’s four kilometer-long walls and ordered metalsmiths to arm his troops with 18,600 bronze swords. Historians believe he then did something that would make sense only to a person of his place and time: He turned his back on the approaching enemy to share a meal with his dead ancestors. It was the new

BONES OF KINGS

The partial remains of two members of Qatna’s royal family lie with offerings inside an open sarcophagus. These jumbled bones and other artifacts provide the first clear evidence for a Near Eastern cult of the dead, until now known only from ancient texts describing feasts where kings invoked the spirits of ancestors to gain blessings. Rather than preserving the body as in Egypt, the people of Qatna used the remains in rituals. “They did things with the bones—talked to them or looked at them,” says archaeologist Peter Pfälzner, whose team found the tomb.



LEFT TO THE GHOSTS

Mud-brick ruins of the modern-day village of Mishrifeh lie half hidden by the shadow of the mound where archaeologists uncovered the Bronze Age royal tomb. To protect the remains of the city of Qatna, the Syrian government relocated Mishrifeh's residents in the early 1980s.

moon, the 29th day of the monthly lunar cycle—a day when the worlds of the living and dead were believed to draw close. In the city surrounding the palace, families gathered in the gloom for meals within the safety of their houses, following a tradition even then ancient. Led by the eldest son, each family remembered the dead, offering food and drink to their ancestors and asking them for blessings in a memorial feast called *kispum*.

Deep in the palace King Idanda fulfilled his duty as eldest son and royal heir, descending to the netherworld below. The way was not easy. The king, his priests, and members of the royal family proceeded slowly with oil lamps and a few torches down a windowless secret corridor. At the end of the corridor the king and his retinue climbed down a wooden ladder to a small landing, then down another ladder to an

antechamber three stories below ground. The priests passed vessels of food and drink from hand to hand down the shaft. Soon the royal party crowded the antechamber, dark as a cave. Idanda led the way into the main chamber of a four-room rock-cut tomb, stepping carefully so as not to disturb the bones lying on wooden biers.

The priests poured milk and beer and served beef and lamb, cereal, salt, and butter. In the farthest corner of the room Idanda sat down on a stone bench to dine with the dead: his parents, grandparents, great-grandparents, and some ancestors so distant he did not know their names. He called to them, starting with his father, whose spirit, once summoned, was believed to recline on a bed in a chamber at the rear of the tomb. We cannot know Idanda's exact words, but similar ones are found in ancient texts recovered across the Near East. "Come! Eat this!



Drink this! And bless Idanda, King of Qatna.”

From such fragments of text, scholars know that the cult of the dead played a central role in state and family religion in Mesopotamia from the third millennium B.C. through the time of the Assyrians, Babylonians, and Israelites in the first millennium B.C. The performance of *kispum* marked eldest sons as heirs to their fathers, whether that meant sitting on a throne and ruling a kingdom or merely leading a family and inheriting its house and land. It also tied the living and the dead together in a relationship of mutual dependence. The dead needed food and drink from the living. And without the blessing of their ancestors, who mediated between the gods and the living, the family would suffer illness, infertility, poverty, and the worst fate of all—to be forgotten when they themselves died. Remembering the dead was believed to keep

the spirits contented and bring good fortune—perhaps even victory in an impending battle.

But Idanda’s ancestors did not deliver him. Enemy troops breached the walls of Qatna and burned the palace, sending mud bricks, foundation stones, and cedar timbers tumbling into the secret corridor. King Idanda and his court were probably captured and executed. The tomb was sealed by tons of debris. For three millennia the world beneath the palace was forgotten until an archaeological team led by Peter Pfälzner, of the University of Tübingen in Germany, stumbled upon it while excavating the foundations of the Bronze Age palace.

Suddenly Qatna’s last days could be understood much more clearly, and the *kispum*, the widespread but mysterious cult of the dead, could be revealed in archaeological detail for the first time.



ART BY ROBERT KINKEAD

Days after opening the tomb, Pfälzner stands on the northern edge of the palace mound and surveys the site. The rising sun casts the hill's shadow wide across a desolate flat below, where houses of ancient Qatna once stood. Nearby, plastic tarps strung over the excavation on the palace mound flutter and flap like sails. A steady wind is blowing from a gap in the mountains to the west—the same gap through which donkey caravans used to travel. A short distance west down the hill stands a ruin of 20th-century houses: the eroded mud-brick walls of old Mish-rifeh, a village of 12,000 until the early 1980s, when the government of Syria resettled its residents to a new town and invited archaeologists to begin excavations.

At the time Pfälzner and his team started working at Qatna in 1999—in collaboration with

archaeological teams from Italy and Syria—no one anticipated they would dig up a perfectly preserved royal tomb. The palace had been destroyed at least three times: once by the army that attacked Idanda; the second time in the 1920s by the Count Du Mesnil du Buisson, a French archaeologist with more enthusiasm than training; and the third time by Christian villagers who built houses on the mound following the count's dig. Nothing of the palace remained from the ground floor up. Pfälzner was hoping to uncover its foundations, to better understand ancient engineering and building techniques.

Four years into the dig, as the team was excavating the foundation near the palace's throne room, it found a flight of stairs leading down. At the bottom stood the charred remains of a massive wooden door that had been burned and collapsed in place. Behind the door lay 63



PASSAGE TO THE NETHERWORLD

Archaeologists lift a jar out of the tomb's antechamber. Ancient priests would have passed such vessels by hand as they descended wooden ladders to the tomb (left), bringing food and drink so the king could celebrate ritual feasts with his ancestors. "The tomb was a kind of palace of the underworld," says Pfälzner. The subterranean corridor and steep shaft that led to the burial rooms symbolically linked the realm of the living with that of the dead. Wealth from trade enabled Qatna's rulers to construct the elaborate tomb and surrounding palace in the late 18th century B.C. Around 1340 B.C., invaders—perhaps Hittites—destroyed the palace, burying what lay below.





well-preserved cuneiform tablets, which had apparently landed in the corridor when a royal archive directly above fell during the fire. Written in a mixture of Hurrian, the language of Qatna, and Akkadian, the official language throughout the Near East, these were Idanda's last correspondence.

But with the regular digging season already over, the excavation started to wind down, and Pfälzner's team traced the mysterious passageway with a skeleton crew. The archaeologists were nearly out of money when they dug up two more tablets, enough to get financial support to continue excavating. Soon they found the end of the corridor and, to the east, the way down to the antechamber below.

"We thought it must be something very important," says Mirko Novak, who managed the Qatna excavation for Pfälzner. "What else could

it be but a royal tomb?" They'd have to wait for an answer. Count Du Mesnil du Buisson had chosen this part of the mound as the place to dump the dirt he excavated, which, together with the rubble from the palace, took Pfälzner's remaining team seven days to move.

On the eighth day the exhausted workers uncovered a half-moon-shaped opening—the top of an entrance. Excited, Pfälzner got a flashlight and shone its weak beam into the pitch black. Next to him, a graduate student on Pfälzner's team spotted something most archaeologists in Syria can only dream of finding. "A sarcophagus," he said. "Yes, a sarcophagus!" Pfälzner agreed. As he turned to hug the workmen, there were tears in his eyes.

Now just days later, Pfälzner leads me down the preserved *mud-brick* steps to the top of the shaft leading to the tomb. We climb down two



SUDDEN DESTRUCTION

Cuneiform tablets (above, at left) found in the corridor tell the story of Qatna's final days. Warned of an approaching invader, King Idanda attempted to fortify the city. Despite such preparations, enemy troops took Qatna and burned the palace. Sealed shut by debris, the main chamber of the tomb (opposite) remained as the king had left it. On the floor lay

thousands of artifacts, including an arrowhead with fragments of gold from the quiver that held it (above, at right) and a limestone cylinder seal (left), used to press the mark of an official into clay.



ladders and reach the entrance, which was guarded by two perfectly intact basalt statues of ancestor kings—a clear sign that the invading army never reached this place, Pfälzner says. “I think this is the exact state of the tomb at the time the palace was destroyed.”

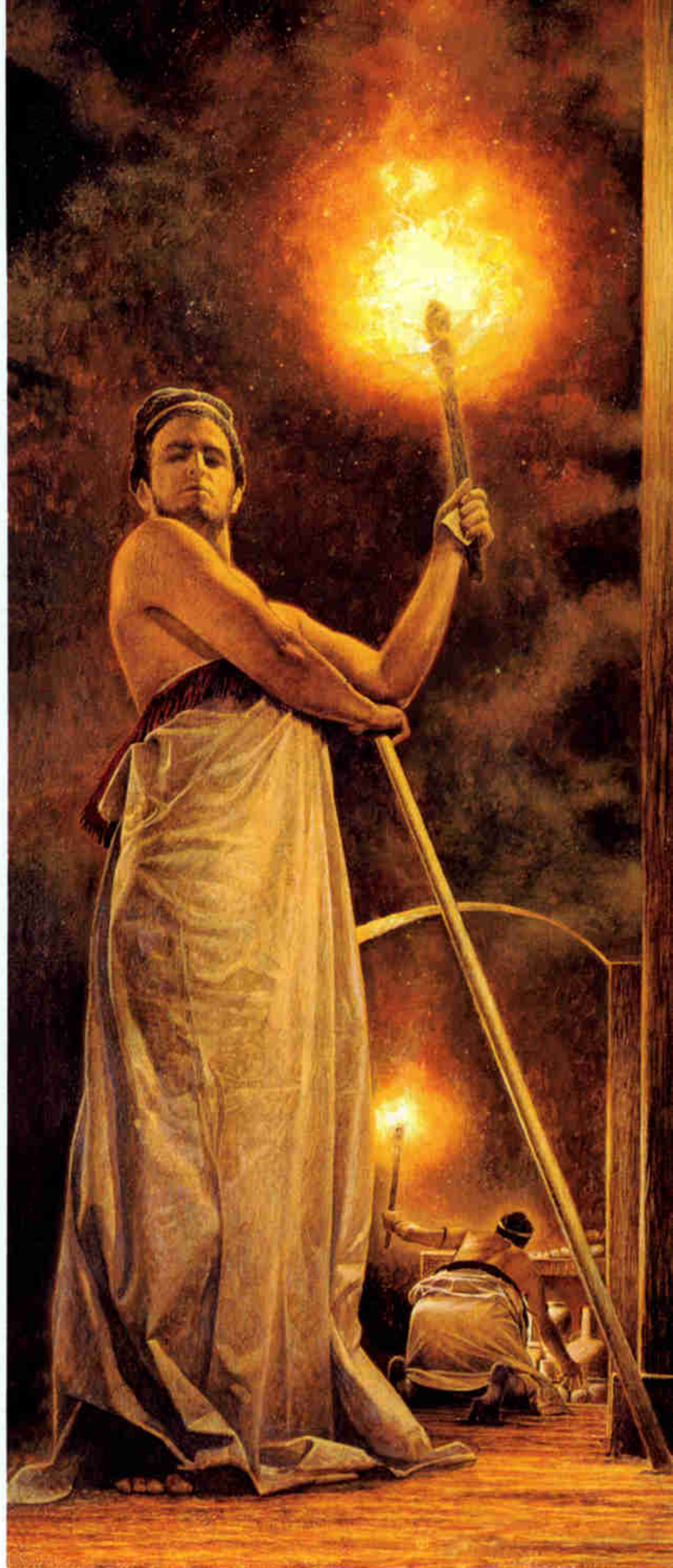
Stacked in one corner of the tomb’s main room are pottery jugs, jars, and bowls—still containing traces of food and drink. On the opposite side of the room, on the ground near where Idanda would have placed his feet, dark stains mark the outlines of wooden platforms for burials. Mixed in the dirt are gold ornaments and corroded blue-green bronze spearheads, and bits of human and animal bone. In another corner a sarcophagus holds portions of three human skeletons, but no skulls.

“For the first time we can reconstruct the ancestor cult in the royal surroundings of the ancient Near East, because all the objects are lying just where they were left,” Pfälzner says. “The bowls are stacked on top of one another, waiting for the next ceremony to take place. The benches are empty so the living could sit—they put burials on the floor. And we have animal bones thrown around in the chamber from a meal. If they had brought these as offerings for the dead, you would not find them below the benches.”

Throughout the tomb, remains of royal ancestors are broken and jumbled, with many bones, especially the skulls, missing. The only set of articulated human bones is a string of vertebrae lying on a body-preparation table in a room west of the main chamber. The floor of the ossuary east of the main chamber is strewn with fragments of human bone, the accumulation of centuries. Bowls have been laid on top, and there are signs of a small fire, perhaps a burned offering.

Pfälzner says all this points to rituals performed with the bones. “It was not like Egypt, where they preserved the body, even the skin,” he says. “The main concern here was that the spirit of the dead person survived.”

“This is a significant find,” says Anne Porter, an archaeologist at the University of Southern California who discovered hints of a kispum-like ceremony at a late third-millennium B.C. Syrian site, Tell Banat. “Ancient Near Eastern society was ancestral. This tomb allows archaeologists to begin to reconstruct in considerable physical detail the relationship of the living and the dead in the ancient world.”



In many ways the cult of the dead was about life, about the links—between parents and children, families and places—that survive death. That becomes clear one evening as Kamel Mansour, a retired geography teacher, takes me on a tour of the old village of Mishrifeh. More than 20 years ago, when the government resettled the village, Mansour and his family moved from his childhood home within the ancient walls of Qatna to new Mishrifeh,



ART BY KAZUHIKO SANO

DINING WITH THE DEAD

Raising a cup to his ancestors, King Idanda presides over a kispum, a ritual feast to feed and honor the dead. As eldest son it was his duty to perform the kispum at least once a month, symbolically proclaiming himself rightful successor to the throne. Behind him a priest sets food and drink in the tomb's throne room, where the spirit of the king's dead father was believed to repose, while torchbearers light a banquet of lamb, beef, milk, and beer for members of the royal family. When archaeologists finally entered the tomb, animal bones and stacked dishes bore witness to the feast.



with its paved roads, running water, and electricity. Mansour can appreciate the archaeological value of ancient Qatna. But he keenly feels the loss of his village. "We moved in August 1981, and I have been gone ever since," he says. "But every night my dreams are of Mishrifeh."

We walk down a muddy, rubble-strewn street amid the ruins of houses. Mansour wears a scarf, tweed jacket, and wool slacks against the damp cold. Rounding a corner, he smiles and points to a yellow wall. It is his family home. He leans forward and, half serious, half smiling, kisses it.

ANCESTOR WORSHIP Has the ancient practice of kispum influenced modern religion, and, if so, how? Post your opinion on our forum board and browse a photo gallery of grave goods at nationalgeographic.com/magazine/0502.

We step through a doorway and into a large courtyard. The sun setting behind Qatna's western wall burns orange on the ruins of the house, the older parts built of mud brick, like the palace. "There was a reception room, there a sleeping room, there the kitchen. There is the clay oven where my mother was baking bread," Mansour says, pointing to spaces off the courtyard. "Here I was born—in this room. There I married. Hisham, my eldest son, was born there."

Mansour puts a tissue to his face. It is hard to tell whether his nose is running because of the raw air, or because he is crying. "In Arabic poetry, they write of ruins with longing, yearning for the past," he says. "We long for, we yearn for these houses."

The light goes out of the sky. The sun has dropped behind the western wall, on its way, the ancients believed, to meet the ancestors. □



A DIFFERENT BREED OF TREASURE

Delicately cast in gold, the heads of two ducks flanking an image of the Egyptian goddess Hathor display details down to the contours of each feather and the serrated edges of the birds' beaks. Archaeologists recovered and conserved many small masterpieces that had adorned the tomb's dead, including a rosette with petals of intricately inlaid carnelian and lapis lazuli (below). Yet they found no large gold ornaments. Had an insider looted



the tomb in the hours before the palace's destruction? Not likely, says Pfälzner. The tomb's contents simply reflect its use as a regularly visited banquet hall rather than a sealed burial chamber. Its value lay in the ancestors whose spirits could be invoked to uphold the king and bless the living.



Living It Up, Paying It Down



BY MARY McPEAK PHOTOGRAPHS BY DAVID McLAIN
NATIONAL GEOGRAPHIC STAFF



A collage of credit cards cut up by reformed debtors—just a few of the 1.3 billion cards used by Americans that are often paid off in Wilmington, Delaware.

REBECCA HALE, NGS STAFF (ZIP CODE NUMBER, ABOVE LEFT)



It's that time again: Write the check to pay for the holiday splurge and mail it to zip code 19886, Wilmington, Delaware. No one lives in the zip code, but several credit card companies get their mail there. On a peak day they receive almost two million payments—enough to fill a Hummer (above).

Delaware has been good for business ever since Éleuthère Irénée du Pont de Nemours fled the French Revolution and built his gunpowder mills along Wilmington's Brandywine Creek 200 years ago. The mill was the start of the DuPont Company, the city's major private employer for generations.

That role is now played by MBNA, a giant in the credit card industry, which moved to Delaware in the 1980s to take advantage of the state's favorable banking laws.

Consumer debt has become an American way of life, one that many find addictive. Wilmingtonians themselves aren't immune to credit card debt, as profiles on the following pages demonstrate.

19886

POPULATION: 0 (19886 is a zip code shared by credit card companies with high-volume mail.)

1949: The year businessman Frank McNamara found himself without his wallet when paying for a New York dinner and thought up the credit card. He and his partner founded Diners Club the following year.

164 MILLION: Number of credit card holders in the U.S.

SANTOS L. HALPER: The name on a credit card ordered by Bart Simpson for the Simpsons' dog, Santa's Little Helper

1.5 TRILLION DOLLARS: Credit card spending (2003)

786 BILLION DOLLARS: Credit card debt (2003)

\$702: Average amount people planned to spend during 2004 holiday season

14,300: Number of employees working for credit card companies in the greater Wilmington area

UNUSUAL USES FOR CARDS: Scraping frost from windshield; burnishing stenciling projects; scratching off lottery tickets; slipping a spring latch bolt on a locked door

WEBSITE EXCLUSIVE Find more on 19886 at nationalgeographic.com/magazine/0502. Tell us why we should cover **YOUR FAVORITE ZIP CODE** at nationalgeographic.com/magazine/zipcode/0502.



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Reema Patel Waitress

Maximum debt: **\$28,000**

The flip-flops: \$2

The trip to Hawaii to get them: \$3,500

"The first class in college should be about credit cards."

STUDENT DEBT

"You've been approved." Those were sweet words to Reema Patel when she was in college. With eight credit cards, she wasn't able to pay down the \$28,000 she had

spent traveling, shopping, and partying by the time she was 21. "I loved having a credit card," Patel says. "I had a great time. I didn't think twice." Patel, now 25, is working as a teacher's aide and waitress to finish paying off her debt on a three-year plan. "I went shopping every day. Now I have to contain myself."

83: Percent of undergraduate college students who have credit cards

4.25: Average number of credit cards per college student

\$2,327: Average credit card debt of undergraduate college student at graduation

Jim Fortune Software developer. Maximum debt: \$20,000

"All I have to show for it is this couch.

I ate like a god for those months. It was just plain fun to spend money."

FEEL-GOOD DEBT

For Jim Fortune, debt started with a job loss. "I lived off credit cards for three months, then I got a job," he says. "But I still used the cards for restaurants, gas, groceries, vacations, and furniture like this couch. The cards were burning a hole in my pocket." Fortune's most serious spending went into his hobby—customizing his Toyota Tacoma pickup truck. "I like to be different, to stand out," he says. When he hit bottom, the 25-year-old Fortune began paying off his debt and soon moved in with his parents. After six years he had succeeded and saved enough to make a down payment on a house.

53: Percent of Americans who reported in 2004 they usually or always pay off their credit card balance

12: Percent who usually pay only the minimum





Winning two Edward R. Murrow Awards for broadcast journalism isn't easy. But for Donna Renae, nothing worthwhile is. Donna's distinguished career began in the U.S. Navy over 20 years ago at Pearl Harbor, where she

DILIGENCE

— DONNA RENAE

UNITED STATES NAVY 1982-1987

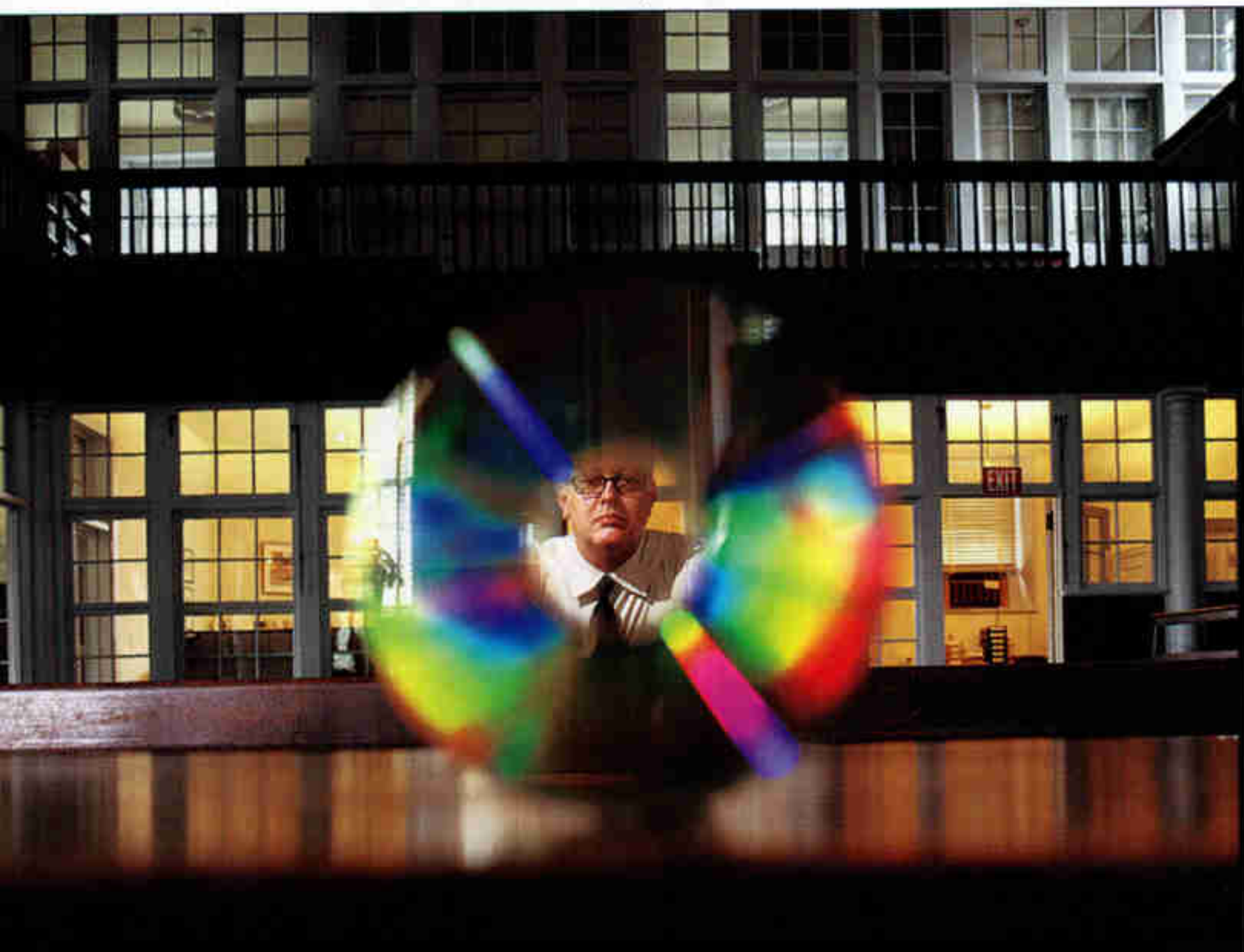
wrote for the base newspaper before enrolling in the Department of Defense school of journalism. There, she not only discovered a passion for broadcasting, but also developed the confidence to pursue that passion and work tirelessly to succeed. And we're proud to report that her efforts were not in vain.

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Tim Gibbs

Director, nonprofit organization

Maximum debt: **\$29,000**

“If it hadn’t been for my good credit, this nonprofit wouldn’t have survived.”

BUSINESS DEBT

Tim Gibbs, who grew up “in a tradition of service to the community,” operates a nonprofit organization helping other nonprofits establish information technology. After the dot-com bust

in the late ’90s, Gibbs kept the company afloat with his personal cards, but soon found himself \$29,000 in debt. “I thought I was doing the right thing,” he says. “My employees depended upon me. I saw this was a way to keep things going. I don’t blame the credit card companies.” Today Gibbs is paying back his debt, has no credit cards, and employs only volunteers.

1,625,208: Individuals declaring bankruptcy in the U.S. in 2003

35,037: Businesses declaring bankruptcy in the U.S.

505: Businesses declaring bankruptcy in Delaware

Mary Rammel

Credit counselor to Patel, Fortune, and Gibbs. Maximum debt: **\$0**

“We live in a material world, and people like *stuff*.”

NO DEBT

“They always ask, ‘Is this the worst you’ve seen?’” Mary Rammel says about her clients at a credit counseling service. “I always tell them I’ve seen worse, and I almost always have. They’re embarrassed to be here. They all have a situation going on—divorce, some have lost a job, illness. Some have brought me to tears. Others, after they leave, I don’t have a lot of sympathy.” Rammel often has clients cut up their cards. “How much debt does this represent?” she asks, spreading the cards across her desk (right). “It humbles me. I admire my clients for doing the right thing.” All sorts go to Rammel for help: doctors, lawyers, CPAs, postal workers.

604: Number of clients Rammel counseled in 2003

MORE THAN FIVE MILLION: Number of people counseled in the U.S. in 2003

FREEZE CREDIT CARD IN A BLOCK OF ICE: What some debtors do to avoid using cards. □



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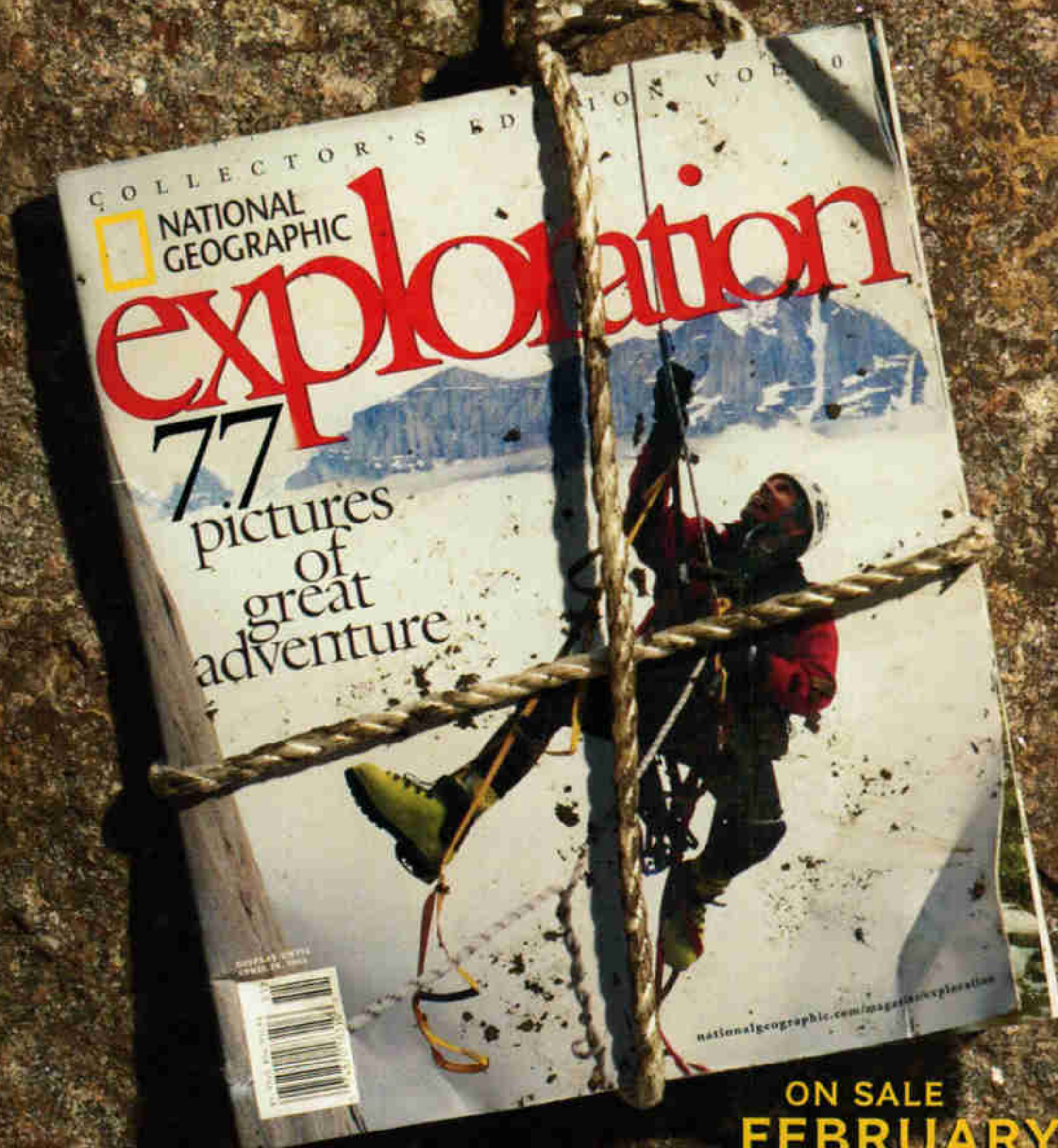
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SALTON SEA

What a Blast

When a biologist invited photographer Gerd Ludwig to join him on a hunt for sick brown pelicans, Gerd leaped at the chance to get close to one of the Salton Sea's most endangered species. The plan was to use a net gun—a four-barreled device that fires rubber balls attached to a net—to capture the birds for transport to a rehab center. With Gerd peering over her shoulder, a U.S. Fish and Wildlife Service staffer, who was firing the gun for the first time, steadied herself, aimed, and pulled the trigger.

The massive recoil knocked her off her feet and into Gerd, who instinctively snapped the shutter as he lurched backward. While the image didn't add much to the complex story of the Salton Sea, it gives a glimpse of the photographer's craft. "Whatever happens, you have to get the shot," says Gerd. "Even if you are falling on your backside."

CUT IT OR KEEP IT?

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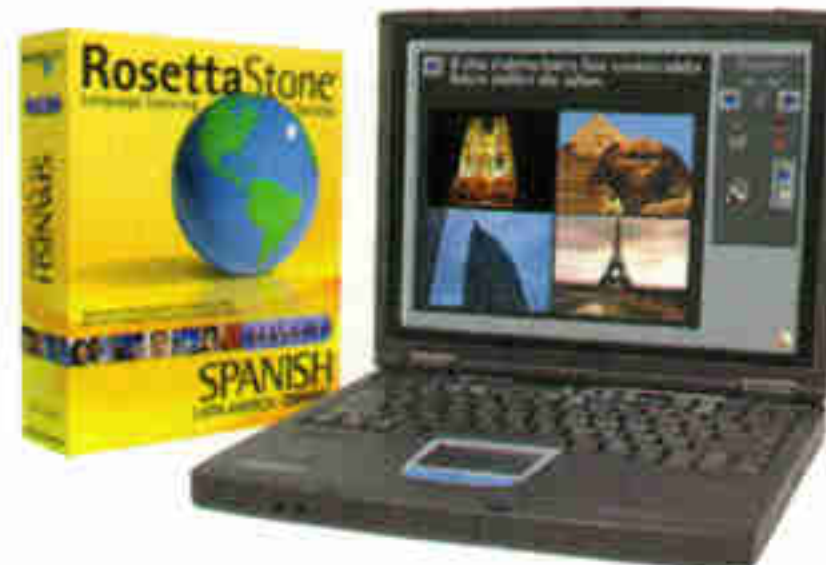
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SYRIAN ROYAL TOMB (SEE PAGE 108)



ANNIE GRIFFITHS BELT

GO THERE

Digging the Past If you've always wanted to try your hand at archaeology, grab a trowel and volunteer as a worker on a dig. The Middle East is home to some of the world's most famous sites, but you don't have to go as far as the ancient Syrian city of Palmyra (above) to discover lost history. Dozens of organizations list fieldwork opportunities for volunteers at digs around the world, including weekend programs throughout the U.S. For longer stints, accommodations range from tents to homestays to hotels. No matter where you sleep, expect to be up before dawn for the often strenuous work of uncovering and preserving the material remains of the past. To find a dig, check out websites for your town or region, or scan the listings at archaeological.org.

TRY IT AT HOME

Make a Meze

Syrian food shares many similarities with cuisine elsewhere in the Middle East. In addition to staple ingredients such as chickpeas and sesame, Middle Eastern foodways include the custom of lingering over an assortment of small dishes called meze (pronounced meh-ZAY).

Many meze are

simple to prepare, and a supper comprising them can be a good way to get a taste of the region. Some popular meze (right) include kibbe, balls of ground lamb and wheat; and tabbouleh, a parsley and tomato salad with mint. Flat bread is a must.

Put together a few different meze, and while away an evening nibbling. If you like, try sipping arrack, Syria's anise-flavored spirit.



REBECCA HALE, NGS STAFF

PICKS

3 arts

Experience Syria's rich culture by sampling music, literature, and film.

■ **Sabah Fakhri** has been a Syrian music star for more than 30 years, and his work preserving and performing traditional songs has earned him fame throughout the world. Check out Fakhri's *Beit Eddine Festival* CDs for a survey of traditional Arabic music genres.

■ **Ulfat Idilbi** is a celebrated Syrian writer whose novels and short stories provide insights into the Muslim world and the interactions among Syria's diverse peoples. Her novel *Sabriya: Damascus Bitter Sweet* is widely available in an English translation.

■ ***Al-Kompars***, a 1993 film directed by Nabil Maleh, tells the story of a young couple's courtship in a culture that prohibits them from being alone together. Initially banned in Syria, *Al-Kompars—The Extras*—won the praise of critics as well as awards for acting and directing. Maleh's *The Hunt Feast* will be released this year.

WEBSITE EXCLUSIVE

Tour a gallery of grave goods and other ancient Syrian treasures at nationalgeographic.com/magazine/0502.

If you paid for Lupron®—used to treat prostate cancer, endometriosis, uterine fibroids, and precocious puberty—you could get a payment from a legal settlement.

A nationwide class action settlement includes people and entities (together called "class members") who paid for Lupron® from January 1, 1985 through March 31, 2005, and who qualify under the settlement. Lupron® is an injectible drug used to treat prostate cancer, endometriosis, uterine fibroids, and precocious puberty. If you're included, you may ask for a payment, or exclude yourself from, or object to, the settlement. The United States District Court for the District of Massachusetts will have a hearing to decide whether to approve the settlement so that payments can be issued.

This is not about the safety or effectiveness of Lupron®.

Lawsuits said there was a fraudulent scheme that caused class members to overpay for Lupron®. The defendants, TAP Pharmaceutical Products Inc., Abbott Laboratories, and Takeda Pharmaceutical Company Limited deny all the allegations.

WHAT DOES THE SETTLEMENT PROVIDE?

Up to \$150 million will be paid. After allocating \$55 million to a separate settlement with certain large insurers, and then deducting attorneys' fees (not to exceed 30% of \$95 million), expenses, and payments to class representatives, the net fund will be distributed in cash to consumers who submit valid claim forms, as well as to insurers and employee welfare benefit plans and other entities, which are also included. Up to 42.1% of the net fund will go to consumers—about \$100 minimum each, or more. A

detailed notice and the settlement agreement are available at www.lupronclaims.com, or by calling 1-866-410-7650.

HOW DO YOU GET A PAYMENT?

Simply fill out and follow the instructions on the claim form below, and mail it by **May 15, 2005**. Or get a claim form at www.lupronclaims.com. The amount you get depends on how much Lupron® you paid for, and how many valid claims are filed.

YOUR OTHER RIGHTS.

If you don't want a payment, and if you don't want to be legally bound, you must exclude yourself by **April 1, 2005**, or you won't be able to sue, or continue to sue, the defendants about the cost of Lupron® or other legal claims in this case, ever again. If you exclude yourself, you can't get a payment from this settlement. If you stay in the settlement, you may object to it if you do so by **March 15, 2005**. The detailed notice explains how to exclude yourself or object. The Court will hold a hearing in this case, called *In re Lupron® Marketing and Sales Practices Litigation*, No. 01-CV-10861-RGS, MDL 1430, on **April 13, 2005**, to consider whether to approve the settlement and a request for fees and expenses by the lawyers representing class members. You may ask to appear and speak at the hearing at your own cost, but you don't have to. For more information call toll free or go to the website listed below.

www.lupronclaims.com

1-866-410-7650

I'd like a payment from the Lupron® settlement.

Consumer Claim Form

Complete and mail to the address below, postmarked by **May 15, 2005**.

Your Name

Dates You or Patient took Lupron® (Month/Year - Month/Year)

Your Address

Name of Doctor who Prescribed Lupron®

Your City, State, Zip

Doctor's City and State

Name of Lupron® Patient / Relationship to you

Patient's Date of Birth

How much money did you pay for Lupron® from January 1, 1985 through March 31, 2005?
(Notes: Deduct any insurance reimbursements you got. Attach one proof of payment if you have it. See the detailed notice. You may be asked for more information at a later time.)

\$ _____

I declare that the information here is true and correct. If not submitting this for myself, I am authorized to submit this form on behalf of the patient above.

Mail by May 15, 2005 to:
Lupron Settlement Administrator
P.O. Box 24604
West Palm Beach, FL 33416

Signature

Date

Flashback



ALL YEAR CLUB OF SOUTHERN CALIFORNIA

GREAT GRAY OWLS

Cold Comfort

Attention-getting structures like Los Angeles's Hoot Hoot ice-cream stand—with a head that spun like a real owl's and eyes that glowed at night—appeared along roadsides all over America in the 1920s. As automobiles became more popular, the shape of these buildings conveyed the nature of their merchandise to customers zooming by.

Exactly why the Hoot Hoot's owner used a giant bird to help sell ice cream has been lost to history. The business has long since flown the coop. Today a Mexican restaurant stands in its place.

—Margaret G. Zackowitz

WEBSITE EXCLUSIVE

You can access the Flashback photo archives and send electronic greeting cards at nationalgeographic.com/magazine/0502.

AMONG THE BOULEVARDS, HIGHWAYS, ROUTES,
THOROUGHFARES, TURNPIKES AND FREEWAYS,
WE'RE DRAWN TO ANOTHER PATH.

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FOR THOSE WITH A SIMILAR ASPIRATION,
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